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A Note on the Wall Strips of Saxon Churches

MEYER SCHAPIRO Columbia University

One of the distinctive features of Saxon architecture of the tenth and eleventh centuries is the pattern of thin strips of stone applied in relief to the walls of church towers. The examples at Earls Barton (fig. 1) and Barton-on-Humber are the most striking and familiar. The older students assumed that these strips were translations of native half-timbered work into stone.[1] But the researches of Baldwin Brown have led to another view, that the Anglo-Saxon builders had imitated the pilasters of Carolingian and Ottonian churches of the Rhineland, forms that had been brought there from Italy and that ultimately descend from Roman and old Oriental buildings.[2] In his now standard book on English mediaeval architecture, the late A. W. Clapham wrote that 'this derivation seems fully established'.[3] The common use of the words *Lisenen* and *lesene* in describing these wall strips indicates the tendency to refer this English form to a foreign source.

The idea of a wood prototype is nevertheless so obvious and compelling that the older theory continues to attract scholars. One is not surprised to learn that J. Strzygowski, the defender of Nordic originality, was among these.[4] But even Clapham was inclined to make an exception of the tower of Earls Barton. 'There can be little doubt', he wrote, 'that the builders, while employing traditional methods, were consciously imitating timber constructions.'[5]

More recently this question has been revived in the histories of English mediaeval art published by D. Talbot Rice,[6] and Geoffrey Webb.[7] While recognizing the resemblance of the network of stone strips at Earls Barton to half-timbered construction, both writers acknowledge an influence from the stone pilasters of Rhenish buildings. It was in Germany, they say, that the primitive wood form

1. John Henry Parker, *An Introduction to the Study of Gothic Architecture* (Oxford and London, 1849), p. 25.

2. G. Baldwin Brown, *The Arts in Early England*, Volume II, *Ecclesiastical Architecture in England from the Conversion of the Saxons to the Norman Conquest* (London, 1903), pp. 58 ff.

3. A. W. Clapham, *English Romanesque Architecture before the Conquest* (Oxford, 1930), pp. 108 ff. and pls. 39, 40, 41.

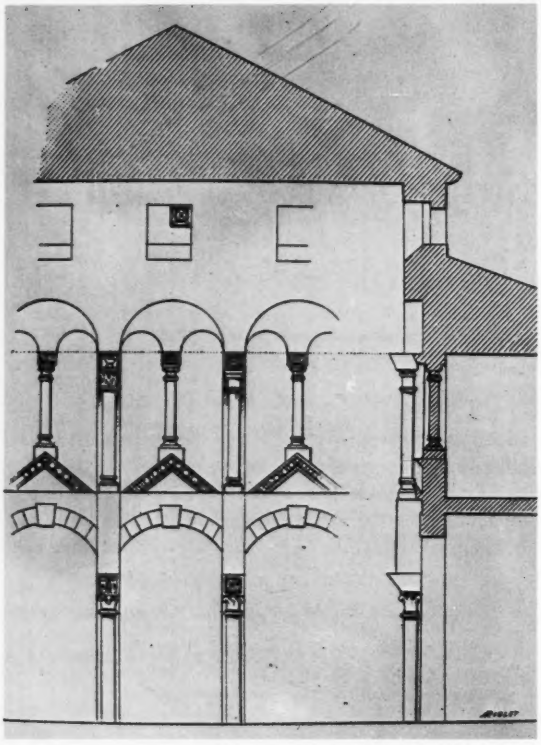
4. Josef Strzygowski, *Early Church Art in Northern Europe* (London, 1929), p. 98.

5. Clapham, *English Romanesque*, p. 109.

6. D. Talbot Rice, *English Art 871–1100* (Oxford, 1952), pp. 52–56.

7. Geoffrey Webb, *Architecture in Britain*: The Middle Ages (Baltimore, 1956), pp. 21–23.

1. Earls Barton Tower, Northamptonshire (from Clapham, *English Romanesque*).



2. Basilica of Tigzirt, North Africa (from Gavault, *Tigzirt*).

3. Evangelist, Gospel manuscript, eighth century, Church of Maeseyck, Belgium (courtesy of Archives Photographiques, Paris).

was first converted into stone; and from the Rhineland it was carried to England. The lack of any sign of such forms in England before the Carolingian period excludes an explanation by native practice in wood.

In his discussion of this motif, Baldwin Brown isolated only one aspect, the thin pilasters ending in mitre arches. Having found this form in German buildings of the Carolingian and Ottonian periods, he was content to accept the latter as models. Strzygowski, however, has drawn attention to the use of oblique strips as braces of the verticals, a quite different form which is undocumented, so far as I know, in the Rhenish churches. This is clearly a device of wood construction, difficult to explain in stone except as a transferred decorative element. The vertical pilasters rise from the apexes of the converging oblique strips in an unconstructive manner (fig. 1). One can point to an example in stone in the sixth century in the basilica of Tigzirt in North Africa (fig. 2); but this is an exceptional instance which the scholar, who first reported and reproduced it, denounced as a bizarre inversion of architectural common sense.[8] The uncanonical mounting of a column on the crown of an arch recurs nevertheless in later mediaeval buildings, even on the South tower of Chartres cathedral which is generally admired as a masterpiece of architectural reason. Before the Romanesque period, only in Saxon England do we find pilasters set above arches in this way; they form an elaborate grid or truss-like structure on the surface of the wall, independent of the main enclosing and supporting masonry.

I wish to bring into this discussion a neglected English work in which the form in question appears almost two centuries before the oldest surviving architectural examples. In a miniature inserted in a gospel book from Aldeneyck (in Belgian Limburg) preserved in the treasury of the church of Maeseyck, the wooden seat of the Evangelist is formed like the wall strips of Earls Barton (fig. 3). The resemblance is too detailed and complex, the forms are too uncommon, for us to regard this design as unconnected with the patterns of wall strips on the Saxon towers. It seems to me clear evidence that woodworkers in England already employed these forms in the eighth century at a time from which no trace of them has survived in stone and well before the presumed contact with Carolingian and Ottonian art in the Rhineland.

This miniature unfortunately cannot be dated precisely or placed in a definite scriptorium. But its Anglo-Saxon origin is evident enough from the ornament of the border. Like the accompanying canon tables the miniature has been bound with a later manuscript that an uncritical tradition ascribed to native Belgian saints in Aldeneyck.

8. P. Gavault, *Études sur les ruines romaines de Tigzirt* (Paris, 1897), p. 39 and fig. 14, p. 73.

Zimmermann placed the older inserted leaves in southern England and in the last quarter of the eighth century,[9] a dating with which Wilhelm Koehler has agreed.[10] More recently Carl Nordenfalk, to whom we owe important studies of manuscript art, has ventured to place the miniature in York and close to the year 700, as a work connected with the Romanizing policy of Saint Wilfrid.[11] It would be extremely interesting to fill the gap in our small knowledge of the art of Wilfrid's circle by a surviving manuscript.[12] But Nordenfalk's arguments have not convinced me. The forms of the ornament resemble most of all those of Vatican, Barberini MS. latin 570, which is probably a work of the second half of the eighth century.[13] As for the place of origin of the Maeseyck pages, it is still a puzzle. Barberini 570 is attributed by Zimmermann to the south of England,[14] by some students—notably T. D. Kendrick—to Mercia.[15] And other manuscripts in which are found elements related to our miniature—such works as the Prayer Book of Cerne and the Codex Aureus in Stockholm—have also been assigned to both Mercia and the South.[16] From the distribution of examples of the timber-like patterns in Saxon churches, one would infer that the manuscript is more probably from southern Mercia than from York. The buildings that show forms related to those on the Evangelist's chair are all south of the Humber.[17] Although Barton-on-Humber is not far from York, it is the northernmost example. There the wall strips are a simplified variant of the form on the tower of Earls Barton (which is in Northamptonshire) and lack the essential oblique trussing that is common to the latter and the chair.[18]

If we accept the miniature as an evidence of the practice of wood construction in England in the eighth century with trussed patterns that served as the models of the stone forms on the towers, we must still recall the surprising analogy offered by the ruined basilica of Tigzirt. How it is related to the Saxon examples I cannot say. It is a reminder that our knowledge of the history of architecture is extremely fragmentary, and that the connections between works are more complex and obscure than our ideas about types and developments imply.

9. E. H. Zimmermann, *Vorkarolingische Miniaturen* (Berlin 1916), I, 142 ff. and pls. 318–320. On page 303 the manuscript is dated 'c.770'.

10. In *Belgische Kunstdenkmaeler*, Paul Clemen ed., 2 vols. (Munich, 1923), I, 3.

11. Carl Nordenfalk and André Grabar, *Early Medieval Painting* (New York, 1958), pp. 121–122.

12. For Wilfrid see my remarks in *Gazette des Beaux-Arts* (January 1950), pp. 135–136.

13. See Zimmermann, *Miniaturen*, pls. 313 ff.

14. Zimmermann, *Miniaturen*, p. 140.

15. T. D. Kendrick, *Anglo-Saxon Art to A.D. 900* (London, 1938), pp. 145–148; also G. L. Micheli, *L'enluminure du haut moyen âge et les influences irlandaises* (Brussels, 1939), p. 28.

16. For the attribution to Canterbury, see Zimmermann, *Miniaturen*, pp. 294–295 (Book of Cerne), pp. 286 ff. (Codex Aureus). Kendrick, *Anglo-Saxon Art*, p. 165, places the Book of Cerne in Mercia, and on pp. 159–160 the Codex Aureus in Canterbury. Sherman Kuhn, 'From Canterbury to Lichfield', *Speculum* XXIII (1948), 591–629, argues for the Mercian origin of the Codex Aureus. He has been refuted by Kenneth Sisam, 'Canterbury, Lichfield, and the Vespasian Psalter', *The Review of English Studies*, N.S. 7 (1956), 1–10, 113–131. I note that F. Masai, *La Miniature dite Irlandaise* (Brussels, 1947), p. 115, n. 95, attributes the Maeseyck manuscript to Echternach, but offers no reasons for his opinion.

17. See Clapham, *Romanesque*, p. 109, for a list of examples.

18. For Barton-on-Humber, see Baldwin Brown, *The Arts*, figs. 123, 126.

The Skyscraper: Logical and Historical Considerations

J. CARSON WEBSTER Northwestern University

IT IS significant that the simplest definition of the skyscraper—an unusually tall building—has not been universally adopted. Perhaps the man in the street thinks of it so, but scholars have generally incorporated some additional factor in their definition of the term. For some time the chief additional factor has been the characteristic structure, leading to definitions such as 'A tall building of skeleton construction'. Recently however, Winston Weisman has suggested that this particular factor be rejected, but not, as one might have thought, in order to adopt the simple definition. He would apparently replace this factor with another, the specific social function of (some of) these buildings, namely, their provision of office space. This would result in some such definition as 'A tall office building'.[1]

The present paper may be introduced by stating briefly two considerations which I believe make it difficult to accept Weisman's implied definition. First, I do not know of any reason for limiting the conception, skyscraper, to office buildings. It is true that something must be done to exclude things like the Washington Monument, the Eiffel Tower, shot towers, etc., which have been invariably omitted from the modern class, skyscraper; but there is a better way to do this, as will be suggested below (Outline, A2). Second, Weisman makes an assumption about the definition of the skyscraper that I do not believe is justified. In brief summary, he finds two possible definitions. One, which incorporates the factor of skeleton construction, he calls the 'technological'. The other, based on height only (unless his limitation to office buildings is to be understood here), he calls the 'visual', and implies that it accords better with the historical development. The assumption he makes is that the skyscraper can be defined on the basis of one or the other of these factors, structure or height, but not on both. This becomes clear in his arguments against the definition based on structure, for his strictures against this would lose their force if height, as well as characteristic structure, were allowed as a factor. For instance, it is objected to the 'technological' view that it would lead to classing relatively low skeleton structures as skyscrapers; but it would do this only if height were not equally allowed as a factor in the conception skyscraper. So far as I can see there is no reason why height and structure should not appear together in a single definition, along with any other factors that seem necessary. And historically they have most frequently done so, as in this definition from the most important work on the history of the skyscraper: 'A building of great height constructed on a steel skeleton and provided with high-speed electric elevators'.[2]

Weisman's paper has the merit of drawing our attention again to the problem of defining the skyscraper. We need to survey the problem anew, in its most general terms. The aim of the present paper, then, is to open a discussion as to just what a skyscraper is: what is the most valid and useful conception of it? The plan of this paper is to present first a list of the factors which, it is suggested, make up a valid modern conception of the skyscraper, based on its developed form rather than on early approaches to it; second, to bring forward some new historical material bearing on the appearance and meaning of the term skyscraper, and to compare the conception of the skyscraper found in some of the early serious studies of it. The setting-off of logical against historical approaches to the term will, I believe, help us attain a greater degree of clarity and objectivity in our ideas.

The logical analysis will be set down first in briefest form for easy reference, to be followed by brief discussion of some of its points. The factors in it are actually a set of

1. Winston Weisman, 'New York and the Problem of the First Skyscraper', *Journal of the Society of Architectural Historians* XII (1953), 13–21. The article is devoted primarily to presenting two candidates for the title of first skyscraper, the Tribune Building and the Western Union Building, both of New York, 1873–1875. The first definition, above, is from Thomas E. Tallmadge, *Architecture in Old Chicago* (Chicago, 1940), p. 194.

2. Francisco Mujica, *History of the Skyscraper* (Paris, 1929), p. 21.

norms, such as are the constituents of any conception of a type, here the skyscraper. General discussion of such norms is highly desirable and should not be considered mere quibbling over words. The conception we in the end adopt will directly affect the answer given to apparently purely historical questions, such as 'Which was the first skyscraper?'

It is suggested, then, that the following are the necessary factors in the developed skyscraper:

A. Essential characteristics (the end)
   1. Great height (relative to buildings).
   2. Arrangement (interior) in stories.
   3. Utmost space and light (potentially) in each story.

B. Necessary means
   1. A structural system adequate to achieving the essential characteristics taken together. To date, this means skeleton construction.
   2. Materials necessary to the structural system, above all steel (iron and reinforced concrete as possible alternatives), and some fireproofing, heat-resisting material.
   3. Passenger elevators.

C. Favoring conditions
   1. Economic—such as high value of land; availability of labor and capital, etc.
   2. Social—such as living in large groups; enterprise; organization of work; publicity; etc.
   3. Technological—such as availability of suitable tools, processes, and sources of power; development of plumbing, heating, etc.; growth of engineering; development of the craft of building to a certain point; etc.
   4. Psychological—desires (conscious or unconscious) which a tall form can express.
   5. Aesthetic—liking for height; preference for the effect of towers related to lower buildings; etc.

A1. Great height. The word skyscraper implies the superlative; hence it should not be applied to buildings that are merely tall, they must be unusually tall. The most natural way of stating the height is in stories, for any observer has an immediate relationship to stories, through his own height, his experience of the size and function of stories, and through the experience of climbing from one to another. A building must exceed five or six stories in order even to approach tallness, and to seem very tall a good many more will be needed. It might help us approach an acceptable norm if we took an old-fashioned aesthetic approach for a moment. The skyscraper would certainly fall in the class of the sublime, for instance as Burke described it.[3] One mark of the sublime is the impression of infinity, the 'artificial infinite', as Burke called it. How many stories are necessary before it begins to seem difficult to take in their number, so that they seem numberless? My impressions suggest that something around fifteen must be exceeded. As long ago as 1909 one qualified observer thought that no building under twenty stories could be called a skyscraper.[4] This height is certainly adequate, and perhaps should be adopted; but in order to be as liberal as possible I suggest tentatively that the lower limit will be at least fifteen, and probably somewhere between fifteen and twenty stories.

Although to state the height in feet does not seem quite so natural as to give it in stories, the height in feet is a more accurate means of comparing different buildings. If I take the impressions I get from actual buildings, I find that those which impress me as being very tall are more than two hundred feet high, again trying to set this limit as low as possible. If this number is translated into stories, taking the average height of a story as twelve feet, we get about eighteen stories as the lower limit.

In regard to collecting impressions of height in buildings, I suggest that one's relationship to a building as one sees it in a city street is the basic frame of reference to be assumed. The picture which a very tall building makes when seen against the distant sky does not communicate so overwhelming a sense of height as does the more immediate touching of the sky when it is seen from below.[5] Moreover, when near-by we experience the building in more direct relationship to its essential functions; we see it in its natural habitat, as it were. Any realistic discussion of the height needed for a skyscraper should therefore, I suggest, be conducted primarily on the basis of the effect as seen from near-by streets. Narrowness of the base, in relation to the height of the building, will doubtless increase the impression of height, but I would not make this a fundamental point, nor the relation in height with near-by buildings. The over-all relation to the observer and his relation to stories are the fundamentals.

3. Edmund Burke, *A Philosophical Enquiry Into Our Ideas of the Sublime and the Beautiful* (London, 1757), part II, esp. section 9.

4. Claude Bragdon, 'The Skyscraper', *Architectural Record* XXVI (July-Dec. 1909), 84–96, based largely on Sullivan's ideas, as seen in 'The Tall Building Artistically Considered', *Lippincott's Magazine* (March 1896). Sullivan avoids the word skyscraper.

5. Lewis Mumford, *Sticks and Stones* (New York, 1924, and reprint, 1955), pp. 173–177, suggests that the skyscraper cannot be apprehended as 'a tall cloudward building' when seen from below. I cannot agree with this, for the thrust into the sky is important, as experience will reveal; the near-by view seems to me to be as necessary as the distant view for complete apprehension of the form, and at least equally constituent of the effect of height. The study by Raymond Unwin of a projected relationship between height of buildings and width of streets in the Chicago Loop, which he cites, does not deal with the distance needed for apprehending the buildings, but solely with the width of street necessary to maintain the same density of traffic with high buildings as with low ones. See *Journal of the American Institute of Architects* XII (1924), 124–131, esp. 127.

A2. Arrangement (of the interior) in stories. This factor is of considerably greater significance than one might at first think. It is important for the classification of very high structures as skyscrapers, for the absence of ordinary stories is the natural means of excluding such things as shot towers, the Washington Monument, church steeples, the Eiffel Tower from the class skyscraper, an exclusion which it is not reasonable to accomplish by the limitation to office buildings. There is no good reason for denying the name skyscraper to apartment buildings, hotels, etc., if they qualify on other counts; as forms, structures, types, they and the office building are essentially similar. Going beyond mere classification, the division into stories is of fundamental importance for the character of the skyscraper. As a type of building, the skyscraper provides spaces suitable for various kinds of everyday activities; and it is this fact, which is directly related to its division into stories, that allows the particular combination of the usual and the unusual which I believe has always been fundamental to the conception skyscraper. It is of the essence of the skyscraper that it combines ordinary spaces, such as would be used in low buildings also, with an extraordinary, a very tall, form. It is not surprising that a monument, an observatory tower, a steeple should be tall, but it is surprising (although we have gotten used to it, since we know the economic motivation) that an office building or an apartment building should be, that one should go up in the clouds to carry on activities that do not need height and which could be carried on perfectly well at ground level.[6] The windows normally denote the stories, and suggest that the building is destined for ordinary activities which do not require spaces of great height but only ample light.[7] One can conceive today of a building without windows or other expression of the floors on the exterior, although this would raise serious questions of expression. However, the present paper deals with the identity, not expression, of the skyscraper, hence the stories are referred to the interior, where they are necessary, in the outline of factors above.

The great importance of the division into stories leads to the suggestion that we should distinguish between the skyscraper proper and any domes or towers (those without ordinary usable space in them), spires, masts, or the like, which may be put up on it—that is, taking the skyscraper to be a building, not a monument or sign. The strictest view is found in an early summary by Sturgis, in which he insists the height should be measured 'from the sidewalk to the cornice . . . in clear vertical height, without including cupolas, finials and bits of pointed roofs'.[8] I believe we can be a bit more liberal than this and say that in addition to allowing set-backs, we should measure from the sidewalk to the cornice or to the roof line of the highest ordinarily usable story. We can then give separate credit, when relevant to some other consideration, for any extracurricular activity, so to speak, in the way of added towers, domes, or spires. Whatever position we take on this question theoretically, there is a practical difficulty in accepting the tower or spire as anything more than an excrescence: one can hardly compare the heights of two skyscrapers fairly, of which only one has such an excrescence, without subtracting its height.

B1. Skeleton construction has been given many, rather similar, definitions. In the interests of objectivity I cite one from an engineer. In skeleton construction 'all external and internal loads are transmitted to the foundation by a framework of metal or reinforced concrete, either separately or in combination'.[9] It would be useful to have a rough definition more completely in visual terms, since we are historians of a visual art. Before introducing the very simplified definition which I should like to use, I shall make one observation. The term skeleton construction has its most immediate significance in relation to a simple masonry wall; it suggests departure from the traditionally constructed wall, which is 'all of a piece', solidly built up, except for modest openings, supporting itself and whatever is above it or tied into it; and it denotes instead a wall constructed on another system, in which there are in principle two kinds of stuff, (1) a framework, which supports, and (2) screening sections, which are carried by the framework. Skeleton construction, especially in relation to a wall, may thus be said to consist of framework and filling, the filling being completely supported by the framework.

How much of a building must be in skeleton construction before we may say that skeleton construction is a significant feature of it? The interiors of buildings of large area already had used what might be called skeleton con-

6. An early perception of this distinction is found in a law proposed in Massachusetts in 1891 limiting the height of buildings, but excepting grain and coal elevators, sugar refineries, steeples, domes, and towers, namely, excepting structures whose immediate function required height. See *Engineering News* XXV (Jan.–June 1891), 602.

7. Henry James' impatience with the 'innumerable windows' of the skyscrapers must have sprung from perception of this contrast between the usual and the unusual, which for him amounted to an incongruity between the potentially wondrous form, which might have rivalled Giotto's campanile, and the devotion of the building to everyday activities, specifically commerce, which is shown by the windows. See *The American Scene* (New York and London, 1907), pp. 74, 77, 79, 92. Also Peter Buitenhuis, 'Aesthetics of the Skyscraper: The Views of Sullivan, James, and Wright', *American Quarterly* IX (1957), 316–324. Some of the buildings are, however, incorrectly attributed.

8. Russel Sturgis, *A Review of the Work of George B. Post* (New York: Architectural Forum, 1898), p. 22. This work contains a brief summary of the development of tall buildings.

9. Frank A. Randall, *History of the Development of Building Construction in Chicago* (Urbana, 1949), p. 11.

struction, whenever isolated supports carried sections of floor or partition. As a result, in regard to the tall buildings of the end of the nineteenth century, the exterior walls would seem to be the critical area in which to look for the presence or absence of skeleton construction. If we add to this the fact that it is the street fronts that are most important in establishing the character of a city building, we shall have some suggestion of an answer to the question. I would suggest, then, that if the street front or fronts (or the exposed fronts) feature skeleton construction in most of their stories, we may say that a building makes significant use of this construction. If another method is used in other parts of a building, it is regrettable from the point of view of economy or consistency but will not obviate the fact that skeleton construction is significantly present. The intention here, as in the case of the height required, is to set the minimum as low as possible.

As examples of the application of this norm, the Tacoma Building, Chicago, of 1888–1889, should be considered a significant example of skeleton construction, even though lot-line, alley, and court walls (and two interior walls) were solid bearing walls, since the two street fronts used skeleton construction so conspicuously and in a manner so directly related to the purposes of a skyscraper.[10] The title of skyscraper should not be refused to the Manhattan Life Insurance Building, New York, of 1893–1894, in so far as structure is concerned, even if, as is reported, its most important front, the Broadway front, was a self-supporting wall, since the other three walls were carried by the steel frame.[11]

It will be noticed that wind bracing is not mentioned in the outline of factors above. This bracing is to be understood as necessarily included in the factor skeleton construction; namely, the construction must be carried out in such a way that it will be secure. The exact manner in which bracing is obtained is left open, whether it be by partitions or sections of solid wall or whether it be by metal members.

Skeleton construction is listed as a necessary factor in our conception of the skyscraper because, in the skyscraper as we know it, this construction is absolutely necessary in order to achieve the desired aims. It has been said (Weisman, p. 13) that to make it a factor in the conception (or definition) represents an over-emphasis on technology; but I would suggest that the structure of a building has considerably more than technological significance. The modern feeling that design should be related to structure is an indication of this; that is, we feel today that structure has a basic aesthetic relevance as well as its practical significance. A long tradition in architectural thought considers structure to be one of the fundamentals of architecture, as in the oft-quoted trinity, commodity, firmness, and delight; and it can hardly be an exaggeration of any kind to make the characteristic structure of a type of building an essential factor in our conception of that type. The fact that skeleton construction has been used in low buildings is beside the point. The relation between the skyscraper and skeleton construction is as follows: in what we call a skyscraper skeleton construction is used in the service of height, light, and space, that is, so as to permit greater height with a greater amount of light (if desired) with a greater amount of usable space on every floor. This relationship is fundamental to the conception skyscraper.

B2. Although iron and other metals can be used in skyscrapers, their use has been rather limited; and no defense is needed for listing steel as the primary material. Reinforced concrete is listed as an alternative because it can be used in the form of columns, girders, and beams, and can thus produce a skeleton frame as a direct counterpart of an all-steel frame.[12] It is recognized that some forms of reinforced concrete construction, namely, column-and-slab construction, box-frame construction, etc., will seem rather different from column and beam framing, but even here the exterior walls will appear as skeleton construction, that is, structural members carrying panels or a curtain.

B3. Passenger elevators are not necessary for erecting a very tall building and holding it up; but, human demands being what they are, the elevators are necessary to the building's being used, hence built. They are therefore shown as a necessary means, just as necessary as the structural system, although on another basis. The same is true of the fireproofing material of B2.

C. There must have been favoring conditions, or skyscrapers would never have been built; but there is no limit to the number of them that might be adduced, either to cover some conceivable case, or to express some judgment or appreciation about the skyscraper and its relation to society in general. For instance, if we wish to take the skyscraper as a symbol, any meaning given to it could be called a favoring condition. Thus, although some favoring conditions are necessary, no given one of them is essential in the way that the factors in A and B are essential.

10. See Tallmadge, *Architecture*, p. 197; Randall, *History . . . in Chicago*, p. 118; and Carl Condit, *The Rise of the Skyscraper* (Chicago, 1952), p. 170.

11. William H. Birkmire, *Skeleton Construction in Buildings* (New York, 1893), pp. 206, 209. Useful for the structure of buildings in New York.

12. An example of reinforced concrete as a direct alternative to steel frame is found in the Whitehall Apartments, Chicago, twenty-three stories, designed for steel but redesigned for reinforced concrete frame (of columns, beams, joists) with the identical layout of columns. See *Engineering News-Record* (30 August 1928), pp. 315–317.

Such a list of the factors in our conception of the skyscraper, should be useful in evaluating proposed definitions, as well as in enabling more just comparisons between individual buildings. For instance, if it is correct to divide the factors, as above, into groups A, B, and C, and to list the type of construction under means (B) rather than under characteristics (A), the outline reveals a logical basis for discarding skeleton construction as a factor necessary for the admission of a building to the class, skyscraper. For it is permissible to argue that admission should be made on the basis of the essential characteristics alone, leaving the question open as to what means will be found, at various periods, to make such a building possible. On the other hand, it is also permissible to argue that the means necessary to achieving the building, and which are not necessary (although possible) in average buildings, will reasonably form part of the conception and will thus be necessary for admission of a building to the class. Which of these views to adopt and where to set the minimum height would seem to be the basic questions today as to the conception and definition of the skyscraper.

Before concluding with a few comments on this question, it will be convenient to formulate definitions from one and the other point of view. In the definition it will not be necessary to mention all of the factors of the corresponding conception, since some of the factors can be taken for granted, as the elevators (B3), and some are implied, as the necessary materials (B2). The one view, which emphasizes the early tall buildings, would lead to *Definition* 1: A tall building arranged in stories. The other, based rather on the developed tall buildings, would lead to *Definition* 2: A very tall building of skeleton construction arranged in stories.

The situation as to the relative usefulness of these two definitions would seem to be this: the first is simpler, and would apply to all of the buildings proposed as skyscrapers in various discussions, from the New York Tribune Building or the Western Union Building on; but it does not indicate, nor imply, all the features that were necessary for this development, particularly the structural system. The second definition covers by statement or implication the necessary factors, but it suggests that the earliest tall buildings, such as the two just cited, were not quite skyscrapers.

Despite the virtues of simplicity and comprehensiveness which recommend the first definition and which make further defense of it unnecessary, I believe there are some considerations in favor of the second definition and the conception on which it is based. First, and most obviously, it will distinguish between the buildings with skeleton construction and those without it; that is, between the early attempts at height and the perfected solution of this problem. Second, it seems that skeleton construction is important enough to require that such a distinction be made, since it is a crucial factor. All the factors which were tending in the last quarter of the nineteenth century toward the skyscraper as we know it—business, land value, elevators, even the so-called cage construction, etc.—would have been helpless by about 1890 to produce the skyscraper, or to carry the development of the tall building further, without the introduction of skeleton construction. Third, there is some value in accepting a term as it has developed. In our tradition of historical studies the conception skyscraper developed so as to include the factor of skeleton construction, and this was not a mere convention created by the historians of architecture; it reflected a development that actually took place in the buildings. After groping experiments in the construction of taller buildings, the way was finally found in which great height could be satisfactorily achieved, namely, in the use of skeleton construction. It would therefore seem preferable as well as more convenient to continue the use of the term in the developed sense, in order both to express this important change and also to avoid the unnecessary inconvenience of having constantly to correct the writings of the twentieth century in which the term is used in this sense.[13]

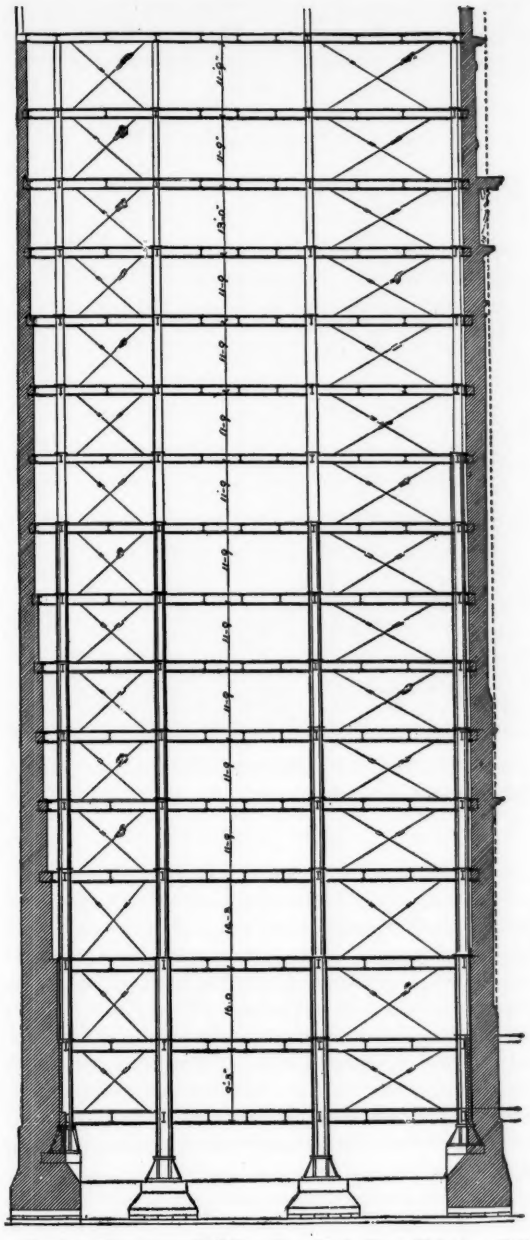
Some citation of specific buildings will doubtless be welcome after this much discussion of norms, and we are led to this by the question that now arises. If we should adopt the conception of the skyscraper represented by the second definition above—an unusually tall building of skeleton construction arranged in stories—what shall we call such buildings as the Tribune, New York, and the Montauk, Chicago? An apt term is at hand, for they were for years called elevator buildings, a name which calls attention to the factor which allowed them to exceed five or six stories and thus initiate the development in height which eventually led to the skyscraper. It is to be understood that their walls are traditional walls which bear at least their own weight.[14] Their height frequently ran up to ten or twelve stories, but usually was well under 200 feet, although occasionally this was exceeded, as in the well-known Monadnock Building, Chicago, or the Havemeyer Building, New York. The latter building, designed by Post and built 1891–1892, is an impressive example of the so-called cage construction. The interior may be said to be in skeleton construction, almost traditional in large buildings, but the exterior walls bear their own weight in traditional manner and even bear the weight of a short

13. The term has been used continuously to the present day, with skeleton construction as a factor, as in William Alex, 'The Skyscraper USA', *Perspectives USA* VIII (Summer 1954), 83–103, based on an exhibition organized by the Museum of Modern Art, New York.

14. Mujica uses the term pre-skyscraper for these, but I think it preferable to keep it to cover all the types leading to the skyscraper, rather than to use it for the elevator building alone.

section of the upper floors. They also contribute to the stability of the interior structure, which was not considered able to resist wind stresses before the exterior walls were up (fig. 1).[15] Raising its fourteen or fifteen stories to just over 180 feet, including the roof house, it approaches a possible border line in height between the pre-skyscrapers and the skyscraper.

Since buildings with this cage construction had what amounted to skeleton construction, even if primitive, in their interiors, the difference in a sense is not great when we come to buildings of skeleton construction, but it is decisive. With the application of skeleton construction to the exterior walls (the street walls particularly) the way was finally open to the great height of the skyscraper, together with the possibilities as to light and space which are essential. Thus the Home Insurance Building, Chicago, 1884–1885, had considerably more to do with the skyscraper than did the simple elevator buildings, for skeleton construction seems clearly to have been present, despite the strictures of Irving K. Pond.[16] However, from our point of view today, this building was not tall enough to be considered a skyscraper. It remains peculiarly important, however, because it represents the point at which the developing tall building intersected the developing metal skeleton (in exterior walls); and the particular position of this building in the development is thus very justly indicated in the concluding phrase of the report of the committee which examined it during its dismantling, in which it is characterized as the 'father of the skyscraper'. The term suggested for it here, and for others of its type, is proto-skyscraper, which is intended to denote a building which is only moderately tall in itself but which has all the factors that are necessary for building usefully to great heights.[17] Neither the stylistic vocabulary nor the



1. Section, Havemeyer Building, New York (from Birkmire, *Skeleton Construction*).

15. Birkmire, *Skeleton Construction*, pp. 109 ff., esp. fig. 58. The term cage construction is not a very logical name for this kind of construction, and it has been given another meaning by some. I shall adopt the meaning just explained, since the term has been used in this sense by Montgomery Schuyler, by Sturgis, and also by Weisman, I believe. Tallmadge (see note 16) summarizes the two meanings.

16. Thomas E. Tallmadge and others, Report of the Committee to Examine the Home Insurance Building, *Architectural Record* LXXVI (1934), 113 ff., with Pond's objections appended, pp. 118 ff., reprinted as *The Origin of the Skyscraper* (Chicago, 1939), with Pond's remarks omitted. He had by no means changed his mind, as is shown by his private copy of this pamphlet, now in the Burnham Library, Chicago, the margins full of peppery comments. Pond's objections are of two kinds: (1) citation of earlier higher structures but of so different a character (for example, the dome of St. Peter's) that they cannot affect the classification of the Home Insurance as a skyscraper; and (2) denial of skeleton construction to it, for instance, because of the two solid walls and the use of partitions for some of the wind bracing.

17. Mujica at two points (pp. 25, 28) calls the Home Insurance Building an 'embryo skyscraper', which differs only in connotation from the term proto-skyscraper suggested for it in the present paper. This impressive study put the Tribune and the Western Union and other buildings in their proper place in the development, and I am gratified that he too felt, if we count his mention of an embryo skyscraper, that there were two types among the pre-skyscrapers.

2. A proto-skyscraper: Chamber of Commerce Building, Chicago (from *Industrial Chicago*).

3. Two elevator buildings: *left*, World Building, New York; *right*, Tribune Building, New York, as enlarged (from Schuyler, *Scribner's*, 1909).

character of the design is relevant to the classification. As expression the proto-skyscrapers range from the grotesque Tower Building, New York, 1888–1889, to the quite fine Chamber of Commerce, Chicago, 1888–1889 (fig. 2), or the dazzling achievement of the Reliance Building, Chicago. The last, in its early state, 1890, comprising only four stories, should not even be called a proto-skyscraper, because of its lack of height. It might be called a kernel, if one wished. From this the proto-skyscraper came directly a few years later, by extending it to fourteen stories.

One of the most confused and confusing of the pre-skyscrapers was the World (Pulitzer) Building, New York (fig. 3), which continues to be confusing in the figures which are given for it. Built in 1889–1890 and designed by George B. Post, it is not described in any detail in Birkmire's books, although they deal chiefly with buildings in New York. Statements as to its height in stories vary widely. Birkmire and Weisman credit it with twenty-six stories, although it is hard to see how one could ever count that far on it. Birkmire at another place gives it sixteen stories, which accords better with its appearance in photographs.[18] One wonders, however, whether he was, even so, counting the underground stories, which was sometimes clearly done, as in the report in the *Engineering News* of 9 November 1889, which gives it eighteen stories, including the underground or foundation stories, and which arrives at a height of 350 feet by including the thirty-five feet of underground 'height' and by counting to the top of the flagstaff. Sturgis gives it thirteen or fourteen stories excluding the tower, which accords with the photographs, and he would rather obviously not count the tower as part of the building proper. In our view this latter should depend on whether or not there were any stories in the tower which were available for ordinary use. Whatever the facts as to useful height, we can hardly call it a

18. William H. Birkmire, *Planning and Construction of High Office Buildings* (New York, 1898). See the 4th edition, 1906, pp. 2–3, for his figures on the heights of representative buildings. If twenty-six stories for the World Building is arrived at by dividing the height over-all in feet by the average height of a story, I would only suggest that this is misleading.

skyscraper, as it had traditional self-supporting walls, namely, the so-called cage construction (Weisman, p. 13). Thus it was an elevator building. Another is the Monadnock Building, Chicago, 1889–1891, with its sixteen stories of pure building rising over 200 feet, its walls of solid masonry construction. That such buildings should have exceeded the Home Insurance and some other proto-skyscrapers in height is just what we should expect to have happened; that is, that the first steps in the new construction should not have carried as high as the last efforts of the old. That they did not is therefore no objection to setting skeleton construction as an essential of the skyscraper as a type.

To conclude this set of examples, the Masonic Temple (Capitol Building), Chicago, 1890–1892 (fig. 4), designed by Burnham and Root, would exemplify the buildings that undoubtedly are skyscrapers. Mujica calls it the first modern skyscraper; that is, in the terms used here it is not merely a proto-skyscraper. The skeleton construction is present, although in the case of some of the piers the decision to have the metal support the brick casing may have come in part only in the process of designing.[19] There were twenty stories of usable floors, plus a roof house, rising to about 300 feet. Whether or not an earlier case of the fully developed type will be decided on, this building will at least illustrate our conception of the skyscraper.

These examples will recall something of the variety of buildings that are met when one considers all the pre-skyscrapers along with the skyscrapers. Those who, like me, regret the multiplication of terms will perhaps be persuaded, when this variety is recalled, that we need more than one term to cover this field. Ordinary usage may very well lump them all together under one name, but in any close study or analysis of this development we shall be doing well if we can get along with only three terms: elevator building, proto-skyscraper, and skyscraper.

Whether faults will be found in the logic of the above analysis or not, a much more general objection will perhaps be made to it, namely, that it neglects the historical development in formulating a logical conception, and that we should base our conception of the skyscraper on the original meaning of the term and on the use of it that was made by earlier writers and critics, especially when discussing the early buildings. I wish therefore to devote a section of this paper to the earliest appearances of the term skyscraper in our sense, and to some of the early cases of its use by critics and historians, adopting here a historical rather than a logical approach to the problem.

19. Joseph K. Freitag, *Architectural Engineering With Special Attention to High Building Construction* (New York, 1895), p. 90. Useful for the structure of buildings in Chicago.

4. A skyscraper: Masonic Temple Building, Chicago (from Feree, *Scribner's*, 1894).

The word skyscraper, in the sense of a building, has been recorded for as early as 1891.[20] Before mentioning earlier examples, I must dispose of a case that has been cited, incorrectly I believe, for 1883, in the *Dictionary of American English*. The reference is to the *Century Magazine* of September 1883 (p. 724), where, however, it occurs in a discussion of decorative art and is used in the general sense of something new, brash, and perhaps big; one cannot be sure that it refers to a building. In any case it is only quoted, here, from an article published in the same year by John Moser, a German-American architect settled in Georgia, in which he proposed certain architectural forms and decorative designs as suitable for an American architecture.[21] Moser used the word in connection with architecture, which is doubtless important, but it is clearly used in its earlier, extended sense of anything high, and not in the later, special sense of the type of building that

20. Mario Pei, *The Story of Language* (Philadelphia, 1949).

21. John Moser, 'American Architectural Form of the Future', *American Architect and Building News* XIII (Jan.–June 1883), 303–305.

we know. Examples of 'skyscrapers' cited by the writer are Upjohn's Capitol at Hartford and the design by Henry L. Gay, a Chicago architect, for the Victor Emmanuel Monument. The writer urges that a public building should have something towering up above all else in the neighborhood, and he concludes, 'In our [American] case it should be slender, vigorous, bold, rakish, daring. . . . This form of skyscraper gives that peculiar American thought.' He furnishes a design for a capitol, and it leaves no doubt as to his meaning; it has a dome, and on top of the dome is erected a form which he calls 'a gigantic skyscraper, contrary to all precedent and practice'. This 'skyscraper' is a purely ostentatious element, in form a compromise between an obelisk and the flèche of the Sainte Chapelle, which he greatly admired. It is clear that the word skyscraper is not used here in our sense of a building for use.

We return therefore to the accepted view, that the term was first used in 1891, which is based, I believe, on its appearance in a Boston newspaper of that year, cited in the *Oxford English Dictionary*, and in the oft-quoted definition in Maitland's *American Slang Dictionary*, published in Chicago in 1891, in which it is referred to buildings in Chicago. Perhaps one can never be sure that one has located the first use of a term, and certainly the term skyscraper, in our sense of a building, can be found in print before 1891. I have noticed it in a Boston architectural magazine for June 1889, where it is found in a report on buildings in Chicago.[22] It is put in quotation marks, however, which perhaps indicates that it was new in this sense, at that time and place. The word occurs in a New York engineering journal in January 1889, also in quotation marks and preceded by the word 'so-called'.[23] These details suggest that this usage was still new in New York as well as Boston early in 1889.

In a book by a New York engineer, written perhaps in 1892, it is stated casually, as if no one would be surprised at it, that the term skyscraper was used in the West rather than in the East.[24] Throughout the eighties the *Chicago Tribune* published on Sundays a summary and discussion of the previous week's developments in real estate and building, and these columns often report specifically on important buildings. They therefore furnish an important locus in which to study the date of appearance and the early meaning of the term skyscraper; and I believe that the conclusions to be drawn from a continuous series of articles of this kind will be of greater significance than any based on scattered appearances in disparate sources.

We find at once that the term skyscraper as we know it is not yet established in these columns in the early and middle eighties. The Montauk Building, of 1881–1882, made a great impression on Chicagoans, but neither in the first description of the 'perfected plans', nor in the story in the general news columns of its completion and occupancy is the word skyscraper used.[25] The sixteen-story building which [Cyrus?] Field was thinking of building in New York is referred to in January 1882 and would have called forth the term, one would think, if it were current by that time, but it is not called a skyscraper. However, in the same discussion there is an approach to the term in the comment on a project of George B. Post for an office building reaching fourteen stories to be erected over the Astor House, restrictions in the will, it was held, making it necessary to leave the hotel on this lot. This project is characterized as most typical of the 'sky-climbing, office-building architecture of the day'.[26] However, at this time, so far as a direct name is concerned, these buildings are called 'huge structures' and the like, not skyscrapers.

There was, it seemed to Chicagoans, a burst of activity in the field of high buildings around 1884, at which time were planned and built the Home Insurance and other buildings that were considered notably high. Actually they were from about eight to twelve stories. One would expect that this feeling might have led to establishment of the term skyscraper. However, this does not seem to have been the case, though the elements which were to form the term appear, but not the fully developed term, and especially not the frank use of it as a noun. The adjective skyscraping is to be found, and it seems to have been the most frequent precursor of the noun skyscraper.[27] The phrase 'scrape the sky' appears; and the word sky is used for the upper part or top (inside) of a tall or tallish building.[28] The word skyscraper appears at least once, not as a noun however, but explicitly as an adjective (as if in place of 'skyscraping'), in the phrase 'skyscraper buildings'.[29] As a substantive some other term is regularly used, such as 'immense office blocks', or 'enormous office buildings'. By 1886 the commentator, looking back on this 'craze' for tall buildings, as he called it, thought it had subsided. Apparently it had done so without inspiring the final establish-

22. *American Architect and Building News* XXV (Jan.–June 1889), 293. The reference is directly to sixteen-story buildings and indirectly, perhaps, to thirteen- and fourteen-story buildings.

23. *Engineering News* XXI (Jan.–June 1889), 50. Most of the buildings cited as examples are in Chicago, although the writer complains that the buildings there are 'useful rather than ornamental'. The thirteen-story Times Building, New York, 1888–1889, is included. For a similar item, but without the word skyscraper, see *Engineering News* XX (July–Dec. 1888), 250–251.

24. Birkmire, *Skeleton Construction*, p. 5.

25. *Chicago Tribune* 15 May 1881, p. 10/3; 15 October 1882, p. 6/5.

26. *Chicago Tribune* 29 January 1882, p. 10/5.

27. *Chicago Tribune* 9 March 1884, p. 19/1; 30 March, p. 15/3; 29 January 1888, p. 2/5.

28. *Chicago Tribune* 30 March 1884, p. 15/3; 30 August 1885, p. 20/6.

29. *Chicago Tribune* 30 March 1884, p. 15/4.

ment of the term skyscraper; and around that time (1886) even the approaches to the term seem to have been less frequent.

By 1889, however, the term was clearly well established, being used frequently in these columns in the first six months of that year; and these occurrences, forming, so far as I know, the first thoroughly established use of the fully developed term, are of especial interest. I shall summarize them briefly and then state the conclusions that I believe are indicated: In the issue of 2 June it is applied, without quotation marks, to a building of twelve stories; on 9 June it appears again, in quotation marks this time; and in the same issue, as well as in that of 16 June, it appears several times, but as an adjective, in the phrase 'skyscraper trust', without quotation marks, being used to refer collectively to the owners of the tall buildings already erected. It was suggested, I am not sure how seriously, that perhaps these men were behind the proposal then being discussed to limit the height of buildings, so as to protect the 'monopoly' already in their hands.[30] On 28 April, in a description of a building of sixteen stories, the word is not used, whereas on 31 March it appears, in quotation marks however, in reference to a building of fourteen stories.[31] On 10 March it was applied, without quotation marks, to a building of ten stories plus basement projected for Detroit, the lowest building to which the word was ever applied at the time of its planning or building, so far as I know.[32] It appears twice in the issue of 13 January, in probably the most important article to be found in these columns, a kind of formal presentation of the new buildings called skyscrapers.[33] It is applied to the Tacoma Building, the height of which is given as 165 feet to the cornice (it had thirteen stories, counting the attic story), to the Owings Building, mentioned by Birkmire for its 'immense height', which is given as 184 feet to the top of the gable (there were 50 feet more in the conical roof of the tower) and fourteen stories, counting the 'story' in the gable, and to the Chamber of Commerce Building, of thirteen stories and 182 feet to the top of the cornice. All three of these buildings were then in the course of construction, and one wonders whether their appearance at the same time did not have something to do with the burgeoning of the term skyscraper in these columns in the ensuing months. I suspect that in the establishment of the word skyscraper in our sense its inspiration was plural, so to speak; that is, it was the realization that such buildings were going to go up in numbers that startled the imagination sufficiently to bring about the establishment of the new name.

It may be, then, that historically these three buildings were the first skyscrapers, in inspiring the establishment of the term and in having it applied to them at the time of their building. In the news item in the *Engineering News* XXI (19 January 1889; see n. 23) it is these three buildings that are cited as Chicago examples of 'the so-called "skyscraper" type of structure'. The same figures on their height are given, and cited in the same manner, and the suggestion lies near that the term skyscraper in our sense may have come to New York along with the news of these three buildings in this issue of 13 January of the *Chicago Tribune*, which remains the earliest single appearance of the fully developed term that I know.

In view of the frequent use of the word skyscraper in these columns in the first half of 1889, it is striking that it apparently does not occur in 1888. Nor is the word used in the description, illustrated, of Buffington's design for a twenty-eight story building, published in the general news columns.[34] In this sense the day of the skyscraper had not yet arrived. The situation in Chicago in 1888 is summarized in an interesting column inspired by the remark of a tradesman who, on being urged to locate his store on an upper floor of one of the tall buildings, retorted, 'People are not in the habit of doing their shopping up in the sky and they object to a store on the 6th or 10th floor'. The columnist admits the cogency of the tradesman's reply, and in his own comments reveals a good deal about the social history of the tall buildings (pre-skyscrapers). He notes that, a few years before, doctors, dentists, photographers, etc., demanded offices near the street; but now, he says, 'The upper stories swarm with them'. He foresees a third phase, in which retail customers will be willing to go 'up in the sky' for ordinary shopping. But at the moment, in Chicago, only the second phase had been reached, which he defines neatly as a period of 'competition between the elevator and the street-car'; and he prophesies that it will not be long before people will prefer going up several stories in an elevator to riding several blocks in a streetcar in order to shop at street level.[35] His discussion shows the feeling of development and imminent change which must have been a necessary prelude to establishing the new name for the tall buildings. But he does not use this name; he only approaches it in the word sky.[36]

30. *Chicago Tribune* 2 June 1889, p. 32/2; 9 June, p. 27/1; 16 June, p. 30/1.

31. *Chicago Tribune* 31 March 1889, p. 29/1.

32. *Chicago Tribune* 10 March 1889, p. 2/2.

33. 'Chicago's Skyscrapers', *Chicago Tribune*, 13 January 1889, p. 2/5–6. The new term also appears in the general news and editorial columns at least by the end of this period, along with continued use of the adjective skyscraping, 4 February 1890, p. 8/3; and 23 March 1890, p. 30/7.

34. *Chicago Tribune* 2 September 1888, p. 27.

35. *Chicago Tribune* 4 March 1888, p. 7/2. In the issue of 22 January it had also been noted that people had not yet entirely accepted the upper floors.

36. 'The Growth of Cities Upward: The Modern Tendency Toward Ten-Story Structures', *Chicago Tribune* 22 January 1888, p. 7/2, is an important general discussion which also does not use

Several related conclusions are to be drawn from these columns as to the appearance of the term skyscraper in our sense. First, it was thoroughly established by the first part of 1889. Second, it was still new in 1889. This conclusion is also suggested by the fact that a variant could still be used. In an issue of July 1889 'cloud-supporter' appears, along with 'skyscraper' and obviously formed in analogy to it.[37] Third, the material in these columns suggests that, in the study of such a term, one should distinguish between approaches to the term, scattered or sporadic use, and fully established use. This is especially important in the case of the word skyscraper, which was present all the time in its extended sense.

The conclusion in regard to buildings is that those of the seventies, or even of the early eighties, like the Tribune, the Western Union, and the Montauk, if we limit ourselves to the historical meaning of the term, cannot properly be called skyscrapers. They were apparently not sufficient to call forth the new name, although the word in its extended sense was ready at hand. It was only later that the term was extended back to such early, and relatively low, buildings, and I believe not primarily by serious critics and historians.

The conclusion to be drawn from these columns as to the height necessary is not decisive. In one case (10 March 1889) it is implied that ten stories is sufficient, although I believe the term was used carelessly here. In the article of 9 June 1889, twelve to sixteen stories is specifically given as the height of the buildings in the skyscraper trust; but among the buildings mentioned are the Rookery and the Chicago Opera House, both of ten stories. In the article of 7 July 1889 the term cloud-supporters refers directly to the more 'modest' buildings, as low as ten stories; and if it is simply an alternative to skyscraper, then the latter term seems to be extended to them. Thus the cases which allow ten stories in one way or another do not seem to be entirely dependable. In the perfectly clear cases the word is used for buildings of twelve and thirteen stories at least. The item in the *Boston Daily News* of May 1893 (OED) mentions thirteen stories in referring to the question whether a building is a skyscraper. The important article of 13 January 1889 in the *Chicago Tribune* puts the emphasis on buildings of thirteen stories or more. The evidence of the early use of the term thus tends rather persuasively toward setting thirteen stories as the lower limit. But we can hardly dismiss completely the cases that seem to allow ten stories as sufficient. I think we must in the end draw a negative conclusion, and say that the evidence of the early use of the term does not allow setting the minimum height precisely. Even though further cases may be found, the above will remain to prevent setting either ten or thirteen as the unexceptionable minimum.

A somewhat similar conclusion is suggested by these newspaper columns, and some other comments, in regard to skeleton construction.[38] This 'Chicago construction' and its advantages were well known in Chicago by the end of the eighties. The Home Insurance was filled with 'an excellent class' of tenants, and was earning its nine per cent on the investment;[39] and it impressed people with its lightness. There was, said a qualified visitor from New York, not a dark corner in it. The earliest description of the projected Tacoma Building, in January 1888, shows that from the first state of its design the skeleton construction was adopted because of the space and light it allowed in a high building; and when it was occupied the experts praised it for its 'light, cheerfulness, comfort'.[40] The important article of 13 January gives 'space, light, convenience, and safety' as the essentials of such buildings. At the end of this transitional period, in January 1890, the value of skeleton construction is summed up as follows: 'The present system of fire-proof building, with steel columns and girders and terra-cotta fillings . . . furnishes security from fire, . . . height, durability, lightness, pure air . . .'.[41] Thus it seems likely that skeleton construction would have been considered in Chicago an important element in the skyscraper at the time this term was established there. Against this is the fact that buildings with bearing walls, for instance the Monadnock, were sometimes called skyscrapers. But, again, there is a curious point about the earliest appearances of the term skyscraper outside Chicago. In the ones that I know, the buildings mentioned are connected with Chicago or with 'Chicago construc-

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the term skyscraper. In my opinion this is an indication that ten-story buildings were not sufficient to inspire the term skyscraper; and that its application to the ten-story building in Detroit must be a thoughtless extension (see note 32). Because of the geographic location of the present writer and his reprehension of competing New York and Chicago schools of architectural history, let it be said that there are remarks in the above discussion and elsewhere which indicate that Chicagoans knew that the first steps in high buildings took place in New York.

37. *Chicago Tribune* 7 July 1889, p. 9/5–6 (not in quotation marks).

38. For early use of this term, with reference to truss framing of bridges, see Carl Condit's forthcoming book on structural techniques in America.

39. *Chicago Tribune* 29 July 1888, p. 7/2.

40. *Chicago Tribune* 15 January 1888, p. 6/1, for the projected construction; also 18 March, p. 31/2. The lot on LaSalle St. for which plans were begun was only twenty-five feet wide. This helped to inspire the use of skeleton construction, as in the case of the Tower Building, New York, in order to save space at ground level. For comment on the building when occupied, see *Chicago Tribune* 12 May 1889, p. 15/1.

41. *Chicago Tribune* 26 January 1890, p. 10/5. Such statements show that we distort the significance of skeleton construction if we think of it as having chiefly technological significance even at this early date. For this early commentator it had a fundamental relevance to the character and purposes of the high building, so that its significance was already functional, structural, even aesthetic, as well as technological.

tion'. One of these is probably the earliest descriptive notice outside Chicago, and for this reason is important for the meaning of the term. In it skeleton construction is clearly taken as a constituent factor of the skyscraper: 'It seems that these new-fangled lofty buildings are built on an entirely new principle. . . . The foundations are piers of steel laid in cement, while the framework is also steel. . . . Each floor is independent of the other, so that the entire framework could be put up and then the mason begin laying the walls at the sixteenth instead of the basement story . . .'.[42] Thus, it seems likely that when the term skyscraper was first used outside Chicago it carried skeleton construction as part of the conception. However, we have the exceptions as noted, and perhaps another series of uses of the term will be found to complement the admittedly isolated cases I have cited from Boston and New York; in particular we must await the results of Weisman's researches into the situation in New York. Let us here too then accent the negative and say that, whatever cases may come to light later, the cases I have cited show that, so far as this early well-established use of the term is concerned, we can hardly insist on making skeleton construction an unexceptionable factor in the concept skyscraper, but neither can we rule it out as an essential factor, since persuasive evidence supports it.

I conclude from this study of the early appearances of the term skyscraper that in regard both to skeleton construction and the needed height—that is, in regard to the chief factors about which there is argument—the early use of the term does not furnish a clear guide as to what its precise meaning should be. We are therefore thrown back on our own resources. We must adopt the concept, and consequent definition, that seems the most useful; and insofar as we wish to respect history we shall do well to respect the term as it has developed. The usage followed by a Mujica or a Tallmadge is just as historical and just as significant historically as any usage found at another date.

Among the early serious discussions of the skyscraper and pre-skyscraper the views of Sturgis and Bragdon have been briefly mentioned above. In addition I wish to notice the views of a few others, particularly the early discussions by Montgomery Schuyler, since he has been cited in support of allowing the title of skyscraper to the Tribune and the Western Union. His study of 1899 shows clearly that at that time Schuyler thought of the tall building as having developed in two phases. The first phase, from about 1875 to 1890 (the study is limited to buildings in New York), was marked by the use of the elevator and 'real walls', the buildings running to about ten or twelve stories. The second phase, from about 1890 on, was marked by the use of skeleton construction, the buildings running up to twenty-five stories. In this article he is primarily concerned with the design of the skyscraper, but in my opinion this makes the study the more important as evidence for his concept of the buildings, which comes out spontaneously, between the lines. He takes skeleton construction to be a constituent part of the skyscraper, which he calls 'the steel-framed tall building', and he tends to apply the name to the buildings which are marked by it and thus belong to the final phase of the development of tall buildings, rather than to the buildings of the first phase such as the Tribune and the Western Union. At one point he calls these two buildings 'new monsters', it is true, but in so doing he is clearly characterizing them for dramatic effect from the point of view of 1875, contrasting them with the pre-elevator buildings of four or five stories. From the point of view of 1899 he refers to them in more matter-of-fact tone as 'elevator buildings', suggesting the usage adopted in the present paper. In his mind there is clearly a considerable difference between the early elevator buildings and the early skyscrapers; and the former are for him not new monsters but 'timid beginnings'.[43] His article of four years later is chiefly a résumé of the previous article, but shows that his views had not changed. In it he does not call the Tribune and the Western Union skyscrapers, and he implies that elevators and skeleton construction are the decisive factors that make a skyscraper.[44] Schuyler's later article, of 1909, seems to me to be less clear as to the development, despite its title.[45] He must have been trying to move to a higher literary plane; he frequently adopts a slightly humorous tone, and the style is more involved, as if he had been trying in both respects to emulate Henry James, whose comments on the skyscraper had been published two years before. Sometimes it is not easy to be sure just how he classifies the buildings, on account of the involved phrasing (p. 260). However, in general his views are the same as in the two earlier articles, although expressed in a more diffuse manner; the elevator buildings are distinguished from the skyscrapers, and there is a group in between made up of unusually tall masonry buildings. At one point (p. 264), he uses the word skyscraper in relation to elevator buildings, but in a play on a quotation from the German, and I do not think this overweighs the distinction between the two types in the rest of the article. He gives the height achieved by the elevator building as twelve to fourteen stories, the sixteen-story Monadnock Building being an exceptionally high one; and perhaps this would indicate that in his mind, although

42. 'How the Skyscrapers Are Built', *Boston Journal*, 7 November 1891, p. 5/6.

43. Montgomery Schuyler, 'The Skyscraper Up to Date', *Architectural Record* VIII (Jan.–June 1899), 230–257.

44. Montgomery Schuyler, 'The Skyscraper Problem', *Scribner's Magazine* XXXIV (July–Dec. 1903), 253–256.

45. Montgomery Schuyler, 'The Evolution of the Skyscraper', *Scribner's Magazine* XLVI (July–Dec. 1909), 257–271. This is the article referred to by Tallmadge *et al.* with incorrect date of 1907.

he does not define it precisely, a building of fifteen stories could qualify as a skyscraper, so far as height is concerned. In any case, he does not call the Tribune and the Western Union skyscrapers, but specifically labels them 'elevator buildings', illustrating them in their remodelled states (p. 261). His still later article, of 1913, is again devoted chiefly to questions of design, but it is noteworthy that he takes the skeleton frame to be a primary characteristic of these buildings.[46] This in the end seems inevitable, since, for questions of design, and for a consideration of the skyscraper as art, the skeleton frame is of fundamental aesthetic relevance; and this is a strong argument against giving up the skeleton construction as an essential factor in the conception of the skyscraper. This summary of Schuyler's articles makes clear, I believe, that he cannot be cited in support of classifying the Western Union and the Tribune buildings as skyscrapers. Actually his views militate against this.

At an even earlier date one of the most thoughtful of the early discussions had appeared, that of Barr Feree, published in 1894.[47] Devoted chiefly to questions of design or treatment, this article too allows the author's conception of the buildings to come out clearly. He considers the essential factors to be (1) elevators and (2) skeleton construction. He sees clearly the relationship of skeleton construction to the high building, as in his remark that such a building would be 'impossible without a mode of construction that would enable it to be built on a lot practically of any size [a very small one, in particular], and without absorbing too much of the area for foundations and supports.' His comment on this construction recalls that of the *Boston Journal* of 1891, for it consists, he says, of 'carrying the weight of a building upon a framework or skeleton of steel. . . . The wall of each floor is supported by its own frame, so that it is perfectly feasible . . . to begin filling in the stone- or brick-work of a building at the top floor.' He views this kind of high building as 'an entirely new type', and its system of construction he characterizes as 'totally different from any heretofore made use of in commercial buildings.' This important discussion, then, would support our making skeleton construction an essential for proto-skyscrapers and skyscrapers. The buildings he cites would fall in those two classes.

The lists prepared by I. N. Phelps Stokes, a long-time observer of the New York architectural scene, do not support our giving the name of skyscraper to the buildings of the seventies.[48] The sections of his lists that are pertinent are headed 'Office Buildings and Skyscrapers', suggesting a distinction which I think should be observed, but with no indication given as to which of these two groups a given building belongs. At least we can see that he does not list the Western Union Building here. The Tribune Building is listed, but he is careful to note the addition of nine or ten stories to it in 1905–1907, and, if it is listed as a skyscraper rather than as an office building, we cannot avoid the likelihood that it is because of this later state. He mentions the St. Paul Building (1897) as 'marking a distinct advance in "skyscraper" design', goes so far as to call the Fuller (Flatiron) Building (1902) 'one of New York's earliest "skyscrapers" ', and refers in general to the period around 1900 (especially 1901) as 'the time which saw the development of the New York "skyscraper" '.

We should expect, of course, that these two buildings would have been called skyscrapers by some people, at least loosely, and I specifically accept that fact. Thus M. A. Mikkelsen, a historian of New York real estate, cited by Weisman (p. 20), in 1898 specifically called them skyscrapers, although I think it is permissible to say that he was clearly extending the title back to them. David H. Ray, a functionary in the New York City building department, would have considered the Tribune and the Western Union buildings to be skyscrapers, Weisman infers from a statement made in 1912, because they were 'well over 200 feet'. Perhaps he would have, but we notice that he considers 200 feet as the minimum height; and since the height beyond 200 feet in the case of the Tribune and Western Union Building was largely tower, not ordinarily useful stories, Ray's opinion is not very persuasive for us today.[49] To refuse the title of skyscraper to these two buildings does not imply that they are unimportant, for as early steps in the development which eventually produced the skyscraper they are clearly of considerable importance. Indeed, if the Home Insurance Building can be called the father, perhaps one of these buildings may be called the grandfather of the skyscraper.

Thus the views of a number of well-qualified observers among the earlier students, and Mujica, whose book can be said to have inaugurated the modern study of the skyscraper, all lend support to our distinguishing the early steps toward height in buildings for ordinary use from the

46. Montgomery Schuyler, 'The Towers of Manhattan', *Architectural Record* XXXIII (Jan.–June 1913), 99–122. Schuyler published other discussions of the skyscraper, but these references sufficiently show his view of it.

47. Barr Feree, 'The High Building and Its Art', *Scribner's Magazine* XV (Jan.–June 1894), 297–318.

48. I. N. Phelps Stokes, *Iconography of Manhattan Island*, 6 vols. (New York, 1918–1928), III, 818, 841, 851, 967 ff. He regularly puts the word skyscraper in quotation marks!

49. Henry-Russell Hitchcock, *Architecture: Nineteenth and Twentieth Centuries* (Baltimore, 1958), pp. 239, 242, 244, apparently follows Weisman in putting the Tribune and Western Union among the skyscrapers, at least in a general way. However, this is a general survey, and I do not wish to imply that in more precise or detailed treatment he would not distinguish between these buildings and the proto-skyscrapers and skyscrapers.

beginning of the skyscraper proper about 1890. The conception of the skyscraper presented in this paper, and deriving primarily from logical or normative considerations, can thus be said to be not entirely at variance with views that have been held since the beginning of serious study of the skyscraper. The historical does not conflict with the logical approach to the degree that one might have supposed. The only serious divergence is in the matter of height, since historical considerations would justify setting thirteen or fifteen stories as sufficient, whereas the logical derivation from direct impression, as I see it, would set eighteen or twenty stories as necessary. We shall have to choose the more useful and meaningful norm.

I return therefore to the normative outline presented above, which, in view of the historical considerations just adduced, I am willing to let stand, and with it the corresponding definition (Definition 2). Those who are not satisfied with either of the chief solutions to the meaning of the term skyscraper, neither with Definition 1 nor with Definition 2—and the degree of plausibility in each will render the other to some extent unsatisfactory—may well feel that the term is more troublesome than useful. Perhaps it leads to imposing an artificial unity on a complex of several types of buildings, thus extending the term so much that it becomes rather useless. The suggestion made here, that we clearly separate skyscrapers from pre-skyscrapers, would, if adopted, help to remove that disadvantage. The term has no doubt lost its original flavor, compounded of humor, bragging, and some community feeling. But whether used in matter-of-fact manner or to recall the heroic days that first called it forth, perhaps it is still useful as a name for a rather striking architectural type; certainly I for one have no desire to advise its extinction. As long as it is used, then, and whenever we wish a degree of precision in our terms, I suggest that the most useful conception of the skyscraper will be that represented by Definition 2, and that the terms elevator building and proto-skyscraper will mark its direct precursors with sufficient, and needed, clarity.

Jacques François Blondel and the *Cours d'Architecture*

ROBIN MIDDLETON

THERE is no background so solid, no starting point so firm for the study of eighteenth-century French architecture as that provided by Jacques François Blondel (1705–1774), an architect of the most commonplace classical kind.[1] During the 1760s he built the bishop's palace at Cambrai, the Hôtel de Ville and cathedral precinct at Metz—now largely destroyed—and designed a new layout for Strasbourg, but of this he saw only a saluting base erected. These extremely thoughtful and sensitive designs are lacking, however, in those qualities of confidence and assurance requisite for success. Blondel asserted his authority rather as a teacher. In 1743, after some protest from the Académie Royale d'Architecture, he opened the first independent architectural school in Paris.[2] There he taught, at intervals, for the rest of his life. The course he directed was complex and full: from eight to two in the morning, from three to nine in the evening, summer and winter, he gave his instruction—design and perspective drawing, drafting and model-making, 'la coupe des pierres', estimates and quantities, mathematics, mechanics, and hydraulics—and encouraged his students to design in addition to the normal range of châteaux, hôtels, and churches, a host of utilitarian structures—barracks and fortresses, hospitals and prisons, dockyards and lighthouses. Twice a week, during April and May, he took his pupils out to look at existing buildings. This curriculum, infinitely more effective than that provided by Denis Jossenay and, later, Loriot at the École de l'Académie, attracted many students from that school; but Blondel was the last man to set himself in opposition to the Academy; in 1755 he was elected a member of that historic institution, and on 1 October 1762 he was made a professor.[3]

His influence as a teacher was enormous; he dominated the world of architectural theory. His lessons stimulated at least one generation of architects; his ideas were assimilated by many more who had never even heard him speak, and survived far into the nineteenth century in the teachings of Percier and Fontaine and their fashionable followers. In particular, the numerous pamphlets and books in which Blondel recorded his ideas, and especially the *Architecture Français*, published between 1752 and 1756, and the *Cours d'Architecture*, issued between 1771 and 1777, served to propagate his ideas; for these books were eagerly read throughout Europe and for many years were widely regarded as the soundest repositories of Academic doctrine.

Blondel was the master of William Chambers in England, of a host of Russian and German practitioners, and of countless, conservative French architects; but, in addition, he taught those more original if more inconstant leaders of late eighteenth-century French taste—Marie Joseph Peyre and Charles de Wailly, Jacques Gondoin,

1. There are numerous short accounts of Blondel's life and work, but they tend to contradict one another on elementary facts and on questions of dates to a rather remarkable degree. A reliable study is lacking. Even Thieme-Becker's *Allgemeines Lexikon der Bildenden Kunstler* is misleading—Jacques François Blondel and Jean François Blondel are there confused. The short entry in the *Nouvelle Biographie Universelle* is certainly to be preferred as a general reference. Other useful references are:

August Prost, *Jacques François Blondel et son oeuvre* (Metz, 1860).

Fiske Kimball, *Le Style Louis XV, origine et évolution de rococo* (Paris, 1949), pp. 215–225.

Emil Kaufmann, 'Three Revolutionary Architects. Boullée, Ledoux and Lequeu', *Transactions of the American Philosophical Society, New Series*, vol. 42, part 3 (Philadelphia, 1952), 436–446.

Emil Kaufmann, *Architecture in the Age of Reason* (Cambridge: Harvard University Press, 1955), pp. 131–133.

Louis Hautecoeur, *Histoire de l'Architecture Classique en France* (Paris, 1950), II, 466–472, 598–604 in particular, though there are references to Blondel throughout this volume, and in the following one as well. Hautecoeur is, however, unduly irresponsible in his account of Blondel's ecclesiastical works and projects; not only are most of the references given on pages 599 and 600 of volume III incorrect, but the quotations cited refer to illustrations other than those reproduced.

W. Knight Sturges, 'Jacques François Blondel', *Journal of the Society of Architectural Historians*, XI, no. 1 (March 1952), 16 ff.

2. For a description of the programs of teaching of J. F. Blondel see his *Cours d'Architecture* (Paris, 1773), IV, lxxxiv–civ, and for an account of the lessons, III, lxxxi–xc. Also J. F. Blondel, *Discours sur la manière d'étudier l'architecture* (Paris, 1747), and *Discours sur la nécessité de l'architecture* (Paris, 1754).

3. Blondel, *Cours*, III, lxxxii, footnote.

Théodore Brongniart and Louis Jean Desprez, Jean Baptiste Rondelet, and those two radicals Etienne Louis Boullée and Claude Nicolas Ledoux.

'Blondel', his disciple Pierre Patte wrote in 1777, 'a réussi à préparer, par ses instructions, la révolution qui s'est faite depuis 20 ans dans le goût de notre Architecture'.[4] But Blondel was not a revolutionary. His writings give no evidence of original and idiosyncratic passion. The spirit of his teachings was simply in harmony with late eighteenth-century tastes. For he allowed his own taste to be inflected by the enthusiasms of his contemporaries. It changed in emphasis through successive years, evolving always towards an ideal of simplicity and restraint, but never quite equalling that of his Neo-Classical contemporaries. Certainly, he was not inspired to give any particular impetus to the Neo-Classical movement; either in the pursuit of a sense of honest, economic, structural expression, or in the search for a new inspiration from the past—and from Greece in particular. His interest in construction, for instance, was at first languid and uncertain, and though his writings later reflected the current concern for structural refinement, he was not altogether persuaded. 'La magie de l'Art', he wrote, 'veut des bornes; trop de hardiesse étonne plus qu'elle ne satisfait.'[5] Similarly, he upheld the seventeenth- and early eighteenth-century tradition, derived from Vitruvius, that the Greeks were the greatest of all architects. 'Il faut avouer', he wrote in 1737, 'qu'ils [les Grecs] ont été les premiers qui ayent donné de la grâce à l'architecture; qu'il a été presque impossible de rien ajouter d'important à leurs proportions, et que les régles qu'ils nous ont laissées sont encore observées aujourd'hui par nos plus habiles architectes.'[6] In 1752 he declared, 'la Gréce doit être regardée comme la source des régles de la bonne architecture.'[7] And in 1771 he maintained, 'on peut regarder les Grecs commes les créateurs de l'Architecture proprement dite, les considérer comme les premiers qui ayent été dignes d'avoir des imitateurs'.[8] But though he warmly approved the feeling for simplicity, and even severity, that the renewed enthusiasm for Greece and her monuments brought into play in the second half of the eighteenth century, he inclined to be more critical and cautious once the enthusiasm became widespread. He disliked imitations of Greek architecture. Roman imitations pleased him even less.

In his *Cours d'Architecture* he wrote:

> Les connoissances qu'il a fallu aux Anciens, pour élever leurs monuments, ont de quoi étonner; cependant, malgré les grands exemples qu'ils nous ont laissés, il n'en est pas moins vrai que les changements arrivés dans nos usages, la différence du climat & la diversité de nos matieres, semblent nous avoir forcés à créer, pour ainsi dire, un nouvel Art pour élever des édifices relatifs à nos besoins: d'ailleurs, il en faut convenir, nous envisageons le spectacle de la Nature autrement qu'eux. Tout est changé, les Moeurs, les Dieux, la Politique; ces changements ont du nécessairement en produire dans les édifices que nous élevons; c'est pourquoi il seroit peut-être déraisonnable de vouloir aujourd'hui élever chez nous des édifices précisément dans le goût de l'antique; une pareille imitation seroit presque la censure de nos productions. Sans doute, les ouvrages des Anciens seront toujours des chefs-d'oeuvre; mais ils ne peuvent nous servir de modeles: leurs Artistes peuvent bien nous apprendre à penser; mais nous ne devons pas penser comme eux. Tous les Peuples ont un caractère, une manière de sentir qui leur est propre: la nôtre un jour ne pourra faire loi, pour les édifices à élever par la postérité.[9]

This was the crux of his philosophy. Refusing to surrender to any ideal, he set up no standard of beauty. Beauty appeared a relative value, changing from age to age, determined by climate and material resources, and hosts of imponderable factors. 'Pour juger du goût', he declared, 'il faut bien examiner les hommes, les temps & les circonstances. Qui croiroit, par exemple, que l'Architecture gothique a eu des Admirateurs, & que le Portail de Reims a peut-être produit plus de gloire à son Auteur, que le Péristyle du Louvre n'en a procuré à Perrault,...'.[10]

But equally, beauty in Blondel's view was based on the acknowledged excellence of certain ideas and traditions. The degree with which he adhered to established criteria, moreover, proved extremely limiting to the development of his own taste. The chief aim of his teaching was to effect an immediate, if temporary, reconciliation of traditional values.

His achievement, in many ways similar to that of the Premier Architect du Roi, J. A. Gabriel (1698–1782), was to consolidate the French tradition that derived from Lescot, Philibert de l'Orme, and Salomon de Brosse, and culminated in the work of the Mansarts, Perrault, and François Blondel—a tradition at once French, classical, and limited, but at the same time allowing a margin for originality and innovation. Blondel revised, but re-established the set of ideas that had been formulated in Colbert's academies with the same patient care and reasonable discrimination that Gabriel exercised in restoring to French architecture the Grand Manner; and if their purity of taste seemed to approximate to the Neo-Classical ideal, it was due rather to a reconsideration of seventeenth-century aims than to any real appraisal of Greek and Roman architecture. Blondel's writings are stamped as products of French academicism: they recall the painful arguments of the 'ancients' and the 'moderns'—those men who claimed that the architecture of antiquity provided a complete and absolute system for design, and those who held that some degree of originality

4. Blondel, *Cours*, v, vii.
5. Blondel, *Cours*, iv, 315.
6. Blondel, *De la distribution des Maisons de Plaisance* (Paris, 1737–1738), i, xii.
7. Blondel, *Architecture Française*, i, 7.
8. Blondel, *Cours*, i, 28. See also i, 85, 454; iv, xiv.
9. Blondel, *Cours*, iii, liv. See also ii, 94.
10. Blondel, *Cours*, iii, lxxv.

was permissible, even desirable. Reacting from the rococo efflorescence of the early eighteenth century, moreover, he found the commonsense and devotion to simplicity endorsed by the seventeenth century highly attractive. He grudgingly conceded a certain moderation and neatness of expression to the works of the English Palladians,[11] though he had a strong liking for the particular object of their aversion, Sir Christopher Wren,[12] but his national loyalties were stronger. He was little influenced by *Vitruvius Britannicus*. Instead, he found his models in the figures of Mansart, Perrault, and François Blondel.[13]

'Selon nous', he wrote categorically, 'la Porte Saint-Denis, par François Blondel, est la première merveille de notre Architecture; le Val-de-Grâce & le Château de Maisons, par François Mansard, le seconde; ensuite le Péristyle du Louvre, . . .'.[14]

But like all good critics, he was continually revising his judgments, though it is fair to add that while his enthusiasms might cool, they rarely evaporated. At times Perrault seemed the noblest of architects, at others François Blondel was without peer, but most often he found a peculiar sort of grace in the works of François Mansart. 'Combien ne sommes-nous pas convaincus de notre insuffisance,' he wrote, 'lorsque toutes les années nous nous transportons à Maisons avec nos Elèves, pour nous y convaincre que Mansard est le Dieu de' l'Architecture, & que ses ouvrages fournissent le modele le plus parfait à imiter pour ceux qui veulent atteindre à la plus grande célébrité.'[15]

Entirely confident in the French initiative, Blondel recommended for imitation the architecture of J. Hardouin Mansart and his followers,[16] which, bridging the years of the Rococo, continued into the reign of Louis XVI and even beyond. He admired the buildings of Cartaud, Leblond, and Lassurance fils and, surprisingly enough, reserved special praise for the works of Germain Bouffrand,[17] who is remembered today rather for the glittering *rocaille* of his salon in the Hôtel de Soubise than for the competence of planning and even sobriety of manner that Blondel recognized in such buildings as the Hôtel d'Argenson and the Hôpital des Enfants Trouvés, both in Paris. But he approved Bouffrand's ideas, and in particular his writings, and was not to be diverted from what he recognized as the excellencies of his architecture by a series of *rocaille* exaggerations. Not that Blondel was willing to overlook the implications of the Rococo movement. In 1737 he strongly dispraised Louis XV's modish designers,[18] though in the same year, it must be admitted, he published designs by Nicolas Pineau, who was soon to initiate the most exotic, asymmetric phase of the Rococo style. Blondel's early manner, moreover, was not sober.[19] But the Rococo movement involved preferences that he could not condone; he was unable, for example, to consider the free play of individual fancy a condition of good architecture. He was of necessity, therefore, opposed to the whole movement. He lost no opportunity to disparage it in his writings: the illustrations that he provided for his books, however, take the bite out of his remarks. Yet it says much for his sensibility that he paid tribute to the taste, talent, and even genius, of Oppenord, Meissonnier, and Germain and, curiously, Borromini—then thought so shocking—and reserved his most annihilating criticism for their followers. 'Combien les Boromini en Italie', he wrote, 'les Meissonniers en France n'ont-ils pas produit de mauvais Imitateurs? Cependant on ne peut refuser quelque approbation à ces hommes de génie; mais il auroit fallu qu'ils restassent originaux: ce sont leurs Copistes qui nous ont appris à avoir une moins bonne opinion de leurs ouvrages.'[20] And again in his last work, *L'homme de Monde éclairé par les arts*—an extravagant, entertaining discussion between the partisans of the Rococo and Neo-Classical styles—the shafts of irony are aimed, not at the originators of the *rocaille*, but at their less respectable champions.

Blondel's most famous and certainly his most influential work was the *Cours d'Architecture*, published in twelve small volumes, from 1771 to 1777. Based on lectures given in 1750, the *Cours* is clearly not a series of lecture notes; the whole has been revised, enlarged, and brought up to date with an alertness and a sense of detachment that is wholly admirable. '. . . une critique trop austere', Blondel wrote, 'est aussi peu propre à instruire, . . .'.[21] The personalities and polemics of the eighteenth century are accurately reflected in this work; they are assessed and placed, as it were. But Blondel did not himself complete the *Cours*. He finished the first two sections dealing with 'Décoration' and 'Distribution', but left only forty-eight pages of writing and some oddly unsuitable plates for the third, on 'Construction'. This was written by Pierre Patte (1723–1814), a pupil of Bouffrand, with a vigorous and

11. Blondel, *Cours*, III, 423.

12. Blondel, *Cours*, I, 93–98; III, 300. Blondel evidently possessed Dugdale's work on Sir Christopher Wren, together with some engravings of St. Paul's by Grelot, prepared in 1747.

13. The names of these three architects appear over and over again in Blondel's writings, but particular references are:

François Blondel: Blondel, *Cours*, I, 424; IV, xlvi.

Perrault: Blondel, *Cours*, I, 99, 130, 423, 425; II, 28, 224–225; III, 64–69; IV, xlvi.

François Mansart: Blondel, *Cours*, I, 101, 130; II, 220–221; III, 85–97; IV, lxxv, xxviii, xliii.

14. Blondel, *Cours*, III, 65 n.

15. Blondel, *Cours*, II, 221.

16. It is unnecessary to list the numerous references to J. Hardouin Mansart and his followers in Blondel's writings, but some of particular interest are to be found in the *Cours*, I, 101, 130, 384, 431; IV, l, 100–106, 331.

17. Blondel, *Cours*, IV, l; also I, 104 n. (f).

18. Blondel, *Maisons de Plaisance*, I, xiv.

19. See the plates of Blondel, *Maisons de Plaisance*.

20. Blondel, *Cours*, III, lxxiii. See also III, 15, 349–351; IV, li; V, 3.

21. Blondel, *Cours*, I, xv. See also IV, lxi–lxii.

well-defined knowledge of structure not shared by Blondel. For, despite his very real interest in technical requirements, he remained to the end far more concerned with the aesthetics of architecture.

The *Cours* is full of contradictions; but there is no uncertainty of approach. From the labyrinth of rights and wrongs a fine, just, and wholly comprehensible doctrine emerges that is firmly founded on the dictates of commonsense and sound reasoning. 'Nous avons sur-tout cherché', Blondel wrote, 'à analyser ce qu'on peut appeler le raisonnement de l'Architecture; nous nous flattons même que cette partie de notre Ouvrage ne sera pas la moins intéressante, nous ayant paru la plus capable de faire éclôre le germe du génie de l'Elève, de développer, d'entendre ses idées, de fixer son imagination, de préparer son esprit pour recoeuillir avec fruit les préceptes les plus approuvés, & parvenir enfin à en faire une application judicieuse dans ses différentes productions.'[22]

But Blondel was, as I have already remarked, no great innovator. He sought to strengthen the independence that the French had won from the Italians in dismissing Bernini from Paris in 1665, and had cultivated since in their Academy. Architecture, Blondel emphasized over and over again, was based on inherited traditions, precepts, and systems of rules.[23] But precedent, in its more severe form, he realized, was too remote and unreal a standard for creation. '. . . les regles seules', he wrote, 'ne peuvent guères former que des hommes froids & médiocres. Le goût réuni aux regles, forme le bon Architecte. Il est vrai que le goût seul est insuffisant; les preceptes lui apprennent à régler les masses de son Edifice, à décider les nus, à déterminer les rapports que doivent avoir ensemble les différentes parties; mais au moins est-il sûr que c'est au goût à les justifier, à les faire valoir & à les embellir.'[24] Taste, he declared elsewhere, was indeterminate.[25] Yet it was clearly not, in his opinion, entirely uncontrollable; being by its very nature wedded to custom.

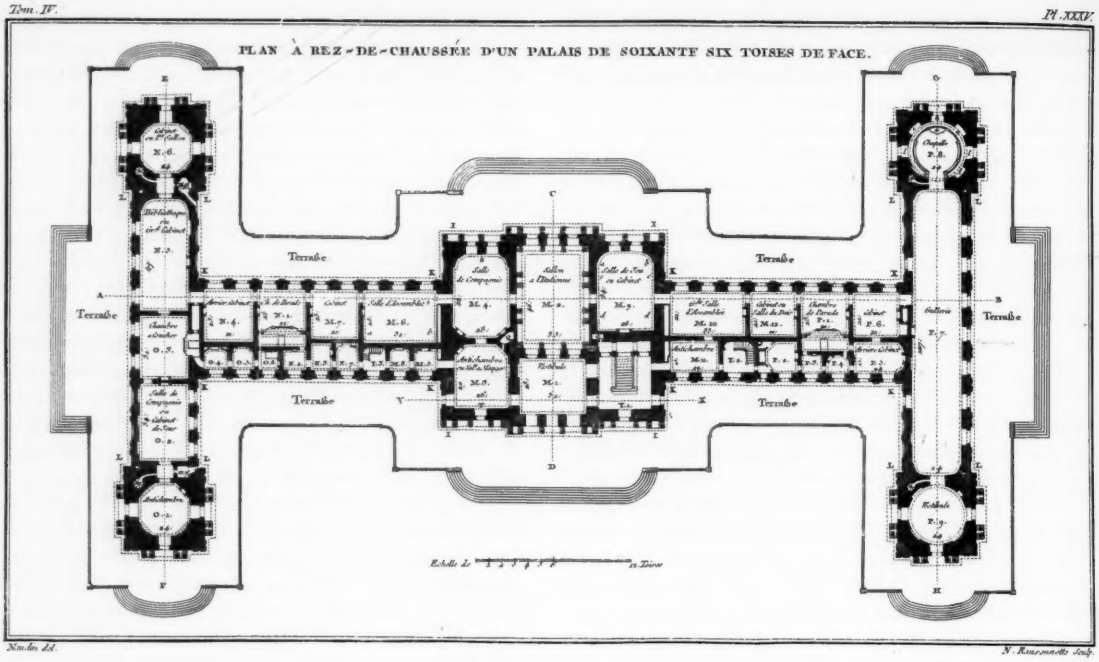
> . . . le goût, comme nous l'entendons, est le Juge-né des beaux Arts, qui n'ont été réduits à des principes constants & positifs, que pour lui plaire; qu'en un mot, le goût de ces mêmes Arts n'est point factice, mais naturel; qu'il est en nous, mais qu'il se peut perfectionner, et qu'alors il devient le flambeau qui sert de guide aux Artistes dans toutes leurs productions. On peut diviser le goût en goût naturel & en goût acquis. Le premier n'est point une connaissance théorique, mais un sentiment des regles mêmes que l'on ne connoît pas; c'est lui qui nous cause le plaisir que nous éprouvons à l'aspect d'un bon ouvrage de l'art, sans autre secours que le sentiment; le second est celui qui procure à l'ame des sensations dont l'esprit peut se rendre compte. Cette derniere espece de goût peut être changée, modifiée ou augmentée par le goût naturel: en sorte qu'on peut dire que le goût acquis, pour se perfectionner, a besoin du goût naturel.[26]

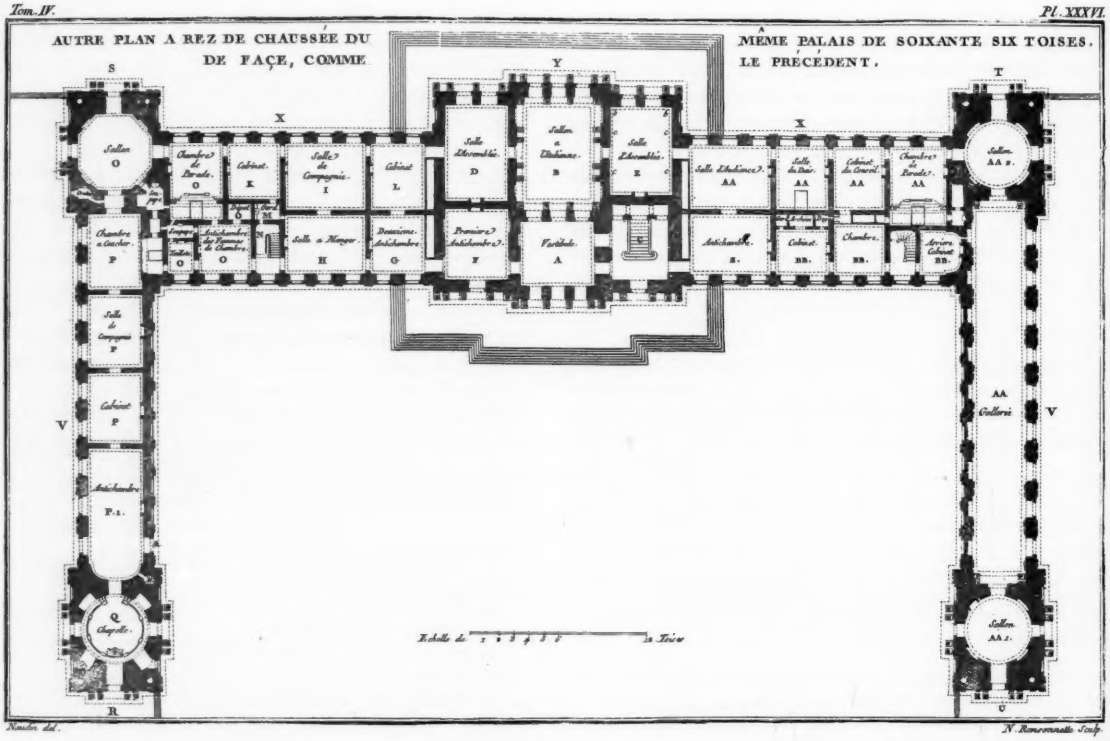
Though partly concerned with emotional responses for which self-conscious rationalism might have no explanation, taste, Blondel added, could be developed by the just and critical examination of all types of architectural work; good and mediocre buildings alike; Egyptian, Greek, Roman, and Gothic works; the structures of the greatest French masters and those of their humblest imitators.[27] For in isolating the specific quality of each work of art, an architect widened the range of his understanding and sharpened his powers of perception. 'Qu'importe après tout', Blondel wrote, 'que nos monuments ressemblent à l'Architecture antique, ancienne, gothique ou moderne, pourvu qu'il en resulte un heureux effet & un caractère convenable à chaque genre d'édifices. Un véritable Architecte est impartial, le beau pour lui est toujours beau; tout est de son ressort, il peut puiser également & dans les différentes productions des beaux Arts & dans celles que lui offre la variété infinie de la nature: . . .'.[28]

Poetic feeling and originality tempered by genius—excellent qualities in Blondel's view—were thus to be allowed free play in the act of creation. Yet they were at the same time to be controlled by the dictates of the most highly developed taste. Everything was to be in conformity: there was to be no false note. The canons of the Greeks and Romans and all the exacting rules of Palladio, Scamozzi, and Vignola could be set aside on occasion, provided always that the work of innovation was so clear and consistent in character that nothing obtruded, nothing was eye-catching, nothing—least of all—was done for effect.[29] As with J. Hardouin Mansart's buildings, which gave a feeling of devotion to an ideal whole, but owed little directly to Greek or Roman architecture.[30] 'Tel est le propre des grands hommes,' wrote Blondel, 'de ne devoir leurs productions qu'à eux-mêmes, et dès-là, de ne pouvoir être imités que par les Architectes de leur classe: . . .'.[31] For the ability to subordinate one's powers of perception and knowledge of rules to the poetic feeling of the whole, 'vraissemblance' he called it, was the prerogative of masters:[32] it was not so much the result of discipline, an act of will, as of a habit of mind—'. . . une heureuse habitude, souvent superieure à la raison même, . . .'.[33]

This dignified and liberal theory is far removed from the negative, circumscribed doctrines developed in England during the early years of the eighteenth century. The title alone of David Hume's *Standard of Taste*, printed in

22. Blondel, *Cours*, I, xvi. See also Patte's comment, *Cours*, V, vi.
23. Blondel, *Cours*, IV, lxv.
24. Blondel, *Cours*, IV, xlvi. See also I, 132; II, 227; III, 294; IV, 347.
25. Blondel, *Architecture Française*, I, 23.
26. Blondel, *Cours*, I, 448–449.
27. Blondel, *Cours*, I, xiv, 383; III, lv, lxx; IV, lxvii. See also, by way of contrast, *Cours*, III, lviii; IV, 244.
28. Blondel, *Cours*, II, 318.
29. Blondel, *Cours*, III, 15–24.
30. Blondel, *Cours*, I, 385, 431; III, lxxiii.
31. Blondel, *Cours*, IV, l.
32. Blondel, *Cours*, I, 392–393, for a discussion on 'Vraissemblence'. See also *Cours*, I, 183, 391–392, 'Du style vrai en architecture'.
33. Blondel, *Cours*, IV, lxvii.




Tom. IV.
Pl. XXXVI.
AUTRE PLAN A REZ DE CHAUSSÉE DU MÊME PALAIS DE SOIXANTE SIX TOISES, DE FAÇE, COMME LE PRÉCÉDENT.
Echelle de 10 Toises
Nicolet del.
N. Ransonnette Sculp.

1. Alternative plans for a country house (from Blondel, *Cours*, IV, pl. XXXV and XXXVI).

1751, evinces the intellectual limitations that conditioned the return to architectural restraint in England. Blondel, in contrast, seems to have known exactly when to temper the intellectual detachment of his theories. For though they are formed there are few formulas. Yet his taste in architecture was, in practice, almost as limited as that of the third Earl of Burlington and his friends.

Blondel imagined an ideal architecture at once simple but full of lively interest; it was to be endorsed by the rule of nature—in the rather complex eighteenth-century sense of that term. '. . . jointe à une variété infinie'; Blondel wrote, 'nous y remarquerons des rapports justes entre les parties & le tout, entre les causes & les effets; nous la verrons simple dans ses moyens, mais sans monotonie; riche dans sa parure, mais sans affectation; féconde en ressources, mais sans s'embarrasser elle-même.'[34] Nature was the paragon, to be interpreted in architectural terms. Plans were to be straightforward and symmetrical in arrangement. Suites of rooms were to be linked together on visual axes, 'enfilades', that could be extended, if necessary, into garden walks and avenues.[35] Each room, moreover, was to be symmetrical in itself. 'Par la symétrie', he said, 'l'on entend la régularité respective des corps mis en opposition, les uns vis-à-vis des autres; la nécessité de placer les cheminées & les trumeaux dans le milieu de la longueur & de la largeur de la piece.'[36] And though in theory he disapproved expedients such as false doors and mock windows, fitted with looking glass rather than glass, he felt bound to accept them. Even the main pieces of furniture were to be placed on axes. '. . . souvent,' he wrote, 'on supprime les portes feintes pour ranger le lit dans un des angles de la piece; ce qui n'est supportable néanmoins, que dans une Maison bourgeoise, . . .'.[37] Yet convenience, he recognized, was a determining factor in planning.[38] He continually lauds the subtlety and ease of arrangement arrived at in the late seventeenth- and early eighteenth-century French architecture. Not that he liked the endlessly varying rhythms of space in which Oppenord and Meissonnier expressed their sensibilities, but rather the straightforward, clearly apprehended relationship of one room to another evinced in the work of J. Hardouin Mansart, in particular, but equally in his successors like Cartaud and Bouffrand.[39]

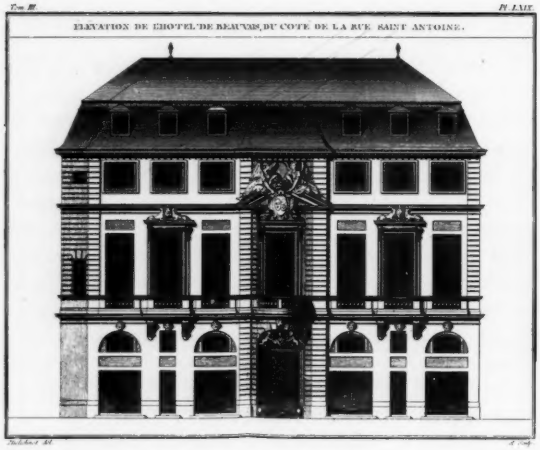
'. . . nos Architectes, depuis les Mansards', Blondel wrote, 'ont donné à la distribution de nos Bâtiments, un dégré de perfection, dont nous ne pouvons plus raisonnablement nous écarter, en ayant une fois reconnu l'utilité & l'agrément.'[40]

Convenience, however, was clearly expendable in the interests of the grand manner; '. . . il ne suffit pas', he wrote elsewhere, 'de concevoir l'arrangement des pieces de parade, de société & de commodité: il ne suffit pas d'établir leur véritable diamètre, de régler leur hauteur, & d'en varier les formes; il faut que ces diamètres, ces hauteurs & ces formes, émanent de la distribution extérieure des corps d'Architecture qui déterminent l'ordonnance des façades: . . .'.[41] And in commenting on alternative plans for an elaborate country house (fig. 1), the one determined by internal requirements, the other by a consideration of mass, silhouette, and external effects generally, he declared, 'Il faut quelquefois, dans un grand édifice, savoir sacrifier l'intérieur à l'extérieur.'[42]

Architectural composition consisted for Blondel in a variety of forms built up regularly and evenly around a central feature, 'une forme pyramidale', usually a pavilion of no great scale or consequence, but emphatic enough to focus attention.[43] He realized that this simplified arrangement might lead easily to dullness and monotony, thus he insisted on a certain liveliness of plan and silhouette.[44] 'En un mot', he said, 'on desire dans un édifice de voir régner, avec l'ordre, une diversité louable, sans laquelle on n'apperçoit que monotonie, où l'on voudroit remarquer des formes assez simples pour être apperçues d'un seul coup d'oeuil, & assez variées pour être examinées avec plaisir.'[45] But each form, no less than each part, was to be distinctly expressed; '. . . rien n'est si contraire aux regles de la bonne Architecture, que de ne pas détacher chaque membre les uns des autres; . . .'.[46] But there was to be no sense of discontinuity in the modelling and no violent contrast. Symmetry, as can be imagined, was to be the controlling factor. 'La symmétrie doit être regardée comme une des principales beautés de l'Architecture; elle doit être considerée comme l'ennemie du contraste; ou du moins elle force, pour ainsi dire, les formes contrastées, quand on est obligé d'en admettre dans les dehors, d'être régulieres dans leurs côtés opposés.'[47]

Character, Blondel believed, was of unquestionable importance in architecture.[48] The purpose of each building was to be clearly evoked by the scale and amplitude of the major elements, by the abundance or sparsity of ornamental motifs, or, more directly, by the use of symbolic

34. Blondel, *Cours*, I, 454–455. See also *Cours*, I, 395–396, 408–409, 413–416, 423–424.
35. Blondel, *Cours*, IV, 193.
36. Blondel, *Cours*, IV, 199.
37. Blondel, *Cours*, IV, 283.
38. He extolled the efficiency of French planning even in his *Architecture Française*, I, 21.
39. Blondel, *Cours*, I, xvii.
40. Blondel, *Cours*, IV, 331.
41. Blondel, *Cours*, IV, lix.
42. Blondel, *Cours*, IV, 244. See also IV, 185.
43. Blondel, *Cours*, I, 386–388.
44. Blondel, *Cours*, I, 396, 314, 398, 403, 443; II, xxxii n.
45. Blondel, *Cours*, I, 459.
46. Blondel, *Cours*, III, 282.
47. Blondel, *Cours*, I, 408.
48. Blondel, *Cours*, II, 229–232. Blondel's concept of architectural character, it is evident, derives directly from that of Boffrand. See his *Livre d'Architecture* (Paris, 1743).



2. Elevation, Hôtel de Beauvais, Paris, by Le Pautre (from Blondel, *Cours*, III, pl. LXIX).

sculpture. 'Sans la Sculpture', he wrote, 'l'Architecture se trouveroit souvent réduite à la sûreté, à l'utilité & à la solidité. C'est par son secours que nos Edifices sacrés, nos Places publiques, nos Maison Royales, deviennent des monuments dignes de la Nation.'[49] Elsewhere he qualified the reactionary implications of this statement, but he did not falter in his belief that both sculptural and ornamental embellishments were necessary to give character to architecture.[50] He described cornucopias, guilloches, cartouches, and caryatids; vases and urns; niches and pedestals; most of which he claimed to dislike.[51] He discussed balustrades and wrote of a variety of pediments,[52] which he approved strongly in their simpler semicircular and triangular forms, though he recommended that on the basis of logic their use be avoided over door and window openings.[53] But what constituted the ornamental part of architecture for him, above all else, was the range of mouldings and entablatures, friezes and cornices, pilasters and columns deriving from the five Orders, each with its varying indication of severity, gravity, elegance, magnanimity, and opulence. The Orders were the key to architectural character. Logically, he held, they were not to be combined. 'Le goût', he wrote, 'semble s'opposer à l'application des ordres d'une expression différente dans une même façade; un seul ordre paroît y suffire.'[54] But in avoiding the use of a plain attic story—a feature he disliked intensely—or in emphasizing the gradations of a central pavilion, he conceded that a sequence of Orders might be used. Certainly, he preferred a combination of Orders to a single giant Order; which he felt was not to be employed except in the design of churches, public buildings, and palaces, as in the work of Perrault, Gabriel, and, presumably, Soufflot.[55] Any attempt to combine giant and regular Orders, he said—hinting darkly at Bernini—was madness;[56] for the scale and system of proportions subtended by each Order was inviolate. Indeed, the proportions of the Orders, authorized jointly by the Greeks and the Romans, refined by Alberti, Palladio, Vignola, and Scamozzi, were vital to architecture. 'Commençons donc', Blondel wrote in the first volume of his *Cours*, 'pour acquérir l'art de décorer nos édifices avec précision & avec goût, par l'étude des proportions des cinq Ordres, comme étant le basa des principes qui concernent la décoration de nos bâtiments, . . .'.[57] And he insisted throughout on the importance of these proportions—the simpler, easily apprehended ratios in particular. He went even further on occasion; he conceived the idea of an architecture almost free from ornament, relying for its effect on the relationship of plain wall surfaces and rectangular door and window openings proportioned in accordance with the rules of the five Orders. This, one might imagine, represented an advance in the state of his Neo-Classical connoisseurship; but the designs that he discussed in this connection reveal other loyalties.

At the end of the third volume of the *Cours* he described and illustrated a number of façades; not one could be called Neo-Classical in style. He shows, as one might expect, an example of fine, unpretentious seventeenth-century French architecture, the Hôtel de Beauvais in the rue Saint Antoine by Le Pautre (fig. 2).[58] '. . . L'ordonnance de cette Façade', he wrote, 'prouve qu'on peut faire une bonne Architecture, sans employer les Ordres. Peut être prouve-t-elle encore que par ce moyen, on parvient à offrir de plus grandes parties, plus de repos, & une sim-

49. Blondel, *Cours*, I, 172. See also I, 339; III, 200–202.

50. Blondel, *Cours*, III, lxxvii. 'Les ornements ne peuvent jamais constituer les beautés de l'architecture, qu'on s'en ressouvienne ils sont seulement destinés pour l'embellir et la faire valoir.' See also *Cours*, I, 345.

51. Blondel, *Cours*, I, 310–312, 336–369.

52. Blondel, *Cours*, 312–314; II, 235.

53. Blondel, *Cours*, I, 315, 464; III, 219. Though Blondel was aware of the purely functional rôle of the pediment in Greek architecture, he did not insist on any such limitations in practice, as many of his more rigorous contemporaries were doing; for him the pediment was, above all else, a decorative feature.

54. Blondel, *Cours*, I, 460. See also II, 159, 167–168.

55. Blondel was usually flattering in his comments on Soufflot's buildings, the church of Sainte Geneviève in particular. *Cours*, I, 108, 423; II, 228, 319, 321, 348; III, 454. There are, however, throughout the *Cours* veiled references to Soufflot's practices and beliefs that could not have been unintentional—all these remarks are derogatory.

56. Bernini occupied Blondel's attention throughout the *Cours*; he strongly disapproved the designs of the Italian, a notable exception, however, being the colonnade of the Piazza San Pietro. *Cours*, I, 130; II, 109; III, 312, 435.

57. Blondel, *Cours*, I, 214. See also I, 191.

58. Blondel, *Cours*, IX, pl. LXIX.

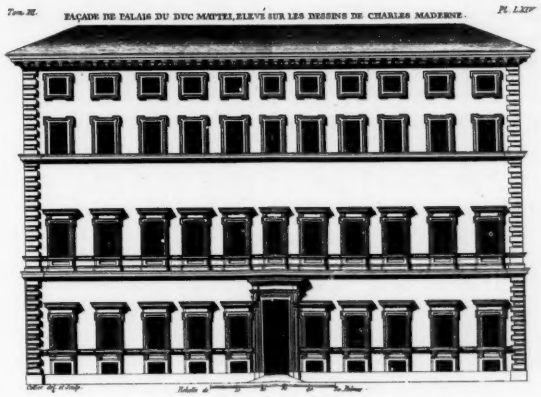
plicité qui la rend amie de l'oeuil, & le satisfait mieux, que lorsqu'il rencontre souvent des ressauts, des retours, de petits objets, & une suite indispensable d'ornements que les Ordres amenent naturellement sur la scène; . . .'.[59]

But he was less enthusiastic, if more eloquent, in estimating the chasteness of Carlo Maderna's Palazzo Mattei (fig. 3),[60] which he considered to represent the modern Roman school. He wrote as follows:

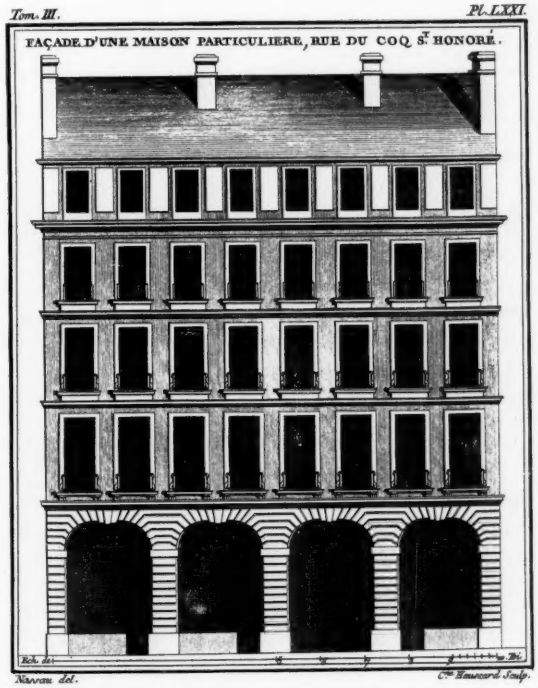
La Façade dont nous parlons est assez simétrique dans ses parties; mais ne peut-on pas dire que cette même simétrie devient monotone? D'ailleurs onze croisées de face, sans aucun avant corps, semblent une simplicité affectée & peu convenable pour annoncer la décoration extérieure d'un Palais. Peut-être abusons-nous trop des ressauts dans nos Bâtiments; mais ne doit-on pas convenir aussi que cette continuité lisse, poussée à l'excés, ne présente plus qu'une composition froide & dépourvue des mouvements que les grâces de l'art autorisent dans certaines occasions? Quel espace considérable, par exemple, ne remarque-t-on pas entre le sommier des croisées du premier étage & l'appui de celles du second? Cette grande hauteur, dira-t-on, est destinée dans les dedans à contenir les voûtes qui terminent les pieces intérieures. Cela peut être: mais à quoi servent les ressources de l'Architecture? Avec combien de génie Mansard, & plusieurs de nos Maîtres François, n'ont-ils pas surmonté la difficulté d'accorder l'extérieur avec l'intérieur de nos Batiments, soit en employant dans les dehors de grandes ouvertures feintes qui en contenoient de plus petites réelles, assorties au genre de l'édifice; soit en faisant usage des niches quarrées, ou en donnant une plus grande élévation à leur entablement?

Mais, disent quelques-uns, tous ces divers membres n'empêchent pas la petitesse des vides, & la grandeur des pleins. Non sans doute; mais ils divisent ceux-ci, ils remplissent les espaces, ils soutiennent le style, caractérisent le genre, & empêchent enfin la désunion que de trop grands intervalles procurent à l'ordonnance. Nous savons bien que quelques Architects apèlent ces intervalles des repos dans l'Architecture: nous savons cela; mais nous, . . . nous les appelons des dissonances, des disparités, des nus qui choquent la vraissemblance & qui nuisent à l'unité; . . .[61]

Palladio, Blondel added, known for a like simplicity in his treatment of wall surfaces, was not to be imitated in this respect.[62] Yet the town houses that he proposed as models in this same volume of the *Cours*,[63] derived their simplicity from Italian, if not Palladian, sources. Blondel illustrates five façades; all conform to a pattern already familiar in France. The lower floors, arcaded or pierced with rectangular openings, act as bases or podiums to the upper floors, which rise through two or three stories to cornices, with attics above. The major emphasis, in each case, is at the level of the first floor. No pilasters or columns are applied. Though unexpressed, the Orders are



3. Façade, Palazzo Mattei, Rome, by Carlo Maderna (from Blondel, *Cours*, III, pl. LXIV).



4. Façade, house in rue du Coq St. Honoré, Paris, by J. B. Franque (from Blondel, *Cours*, III, pl. LXXI).

implicit in the whole arrangement. From these houses, one in the rue du Coq St. Honoré by J. B. Franque in particular (fig. 4), the prototype of Fontaine's rue de Rivoli street façade, one may form an idea of Blondel's taste at its most straightforward and unassuming. All his demands for simplicity, it is evident, do not make him an upholder of the Neo-Classical ideal. They only serve to

59. Blondel, *Cours*, III, 446.

60. True to his beliefs, Blondel broadened the study of architecture to take in the Italian school entire, though it is clear that he was not inclined to recommend the modern Italian school as a source of particular inspiration. *Cours*, III, 221. He was nonetheless familiar with the work of Bernini and Borromini, as we have seen, the Fontana's, Antonio San Gallo, Rossi, etc. *Cours*, III, 421–435.

61. Blondel, *Cours*, III, 429–430. See illustration *Cours*, IX, p. LXIV.

62. Blondel, *Cours*, III, 431. See also I, 387.

63. Blondel, *Cours*, III, 454–460; IX, pl. LXXI–LXXIII.

show, very characteristically, that he sought to revise and to purify the French tradition. He spoke favorably and very briefly of one or two buildings by his pupils Peyre and de Wailly, Chalgrin, and Ledoux,[64] and was even disposed to wonder at Lecamus de Méziere's vast Halle au Blé, then without its dome. But he neither approved nor was willing to condone the changes that these men introduced into French architecture.[65] For example, he strongly disliked the massiveness of form which a renewed interest in Greek and Roman antiquity inspired in France during the second half of the century. '. . . la plupart de nos Elèves', he wrote, 's'y trompent-ils tous les jours; il leur paroît plus aisé d'arriver aux compositions gigantesques, qu'aux proportions de la belle Architecture; . . .'.[66] And he was equally contemptuous of the fashionable novelties 'à la Greque' with which architects and interior decorators enriched their designs; '. . . tant de productions informes', he wrote, 'tant de décorations extravagantes, gigantesques ou puériles, qui annoncent la décadence du goût.'[67] More bitterly, in *L'Homme du Monde éclairé par les arts*, published posthumously in 1774, he attacked the man to whom he believed more than to any other, this decadence was due. 'La plupart de nos jeunes architectes', he wrote, 'sont raisonneurs et ne raisonnent pas; et la plupart des propriétaires sont des ignorans présomptueux. Parce qu'ils ont lu essai de Père Logier [sic] ils se croient très instruit; de-là cette prodigalité de monstres.'[68]

To the very end of his life Blondel strove thus to restore to French architecture the grand yet precise elegance of seventeenth-century building—an ideal that was not inimical to the Neo-Classical movement, but one that was independent of it.

64. Blondel writes with pleasure of M. J. Peyre and de Wailly's project for the Comédie Française, *Cours*, I, 110; II, 270; and of M. J. Peyre's Hôtel Nivernais, *Cours*, I, 110. Chalgrin is mentioned for his design for the Comte de Saint Florentin's house in the rue St. Florentin, Paris, *Cours*, I, 110. And Ledoux for the Hôtel d'Uzes, *Cours*, I, 110.

65. Blondel, *Cours*, I, 108.

66. Blondel, *Cours*, IV, lxx. See also I, 427 and n. 9; IV, xv, lxxvii.

67. Blondel, *Cours*, I, 138. See also I, 136; II, 146; III, lviii; IV, 244.

68. Blondel, with C. N. Cochin, *L'homme du monde éclairé par les arts*, 2 vols. (Amsterdam, 1774), II, 13. See also p. 314, n. 81. 'Logier [sic] (le Père), Jésuite, nous a donné, il y a quelques années un Essai sur l'Architecture, vol. in-12, qui a eu beaucoup de vogue parmi les gens de bel air. Il eût été à désirer qu'il s'en fût tenu à ce que les autres ont dit, qu'il a très bien rendu, quoique d'une manière très-abrégée. Ce qui est de lui dans ce petit ouvrage n'a pas le même mérite, et prouve assez qu'il faut être instruit à fond des préceptes de l'art, pour oser écrire sur cette matière.'

The Rotary Jail, or Human Squirrel Cage

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THE 'silent speech' of the stones of the builder cry out in loud tones the character of the builder and the people for whom the structure was built. Apart from a small minority, historians agree that the life, the social existence, and the behavior patterns of a people are fixed into the static and three-dimensional forms which an architect creates. A building is, therefore, the visual construct of the social institutions in the culture of a people. A temple is the manner in which the eyes of a people see religion. In this sense it can be said that architecture is a more accurate picture of a given time and society than written records found in books.

As acceptable as this view may be, when or if an observer attempts to go beyond the physical forms to ask or to interpret what 'lies beyond the stone or steel one may travel down a singular road where few agree'. A cathedral may inspire a certain sense of reverence but why the builder desired such an emotion is quite another problem. It may be that the cathedral is a lasting symbol of man's need for salvation, therefore, the spire and the vaulted arch. If this is true for a place of worship what can be said of a prison? Is a prison the outward symbol of man's condemnation? Or is it possible that people need no such objectification for an apparent reality? This, in part, is the problem with which the investigator has been concerned.

Whatever may lie beyond the symbolism of a prison, when civil and military authorities in the eighteenth and nineteenth centuries incarcerated malcontents or criminals, they converted existing castles or fortresses into jails. Later when the governments in the New World commissioned architects to design a prison, the earlier structures assumed a castle or Bastille-like appearance. The well-known Berks County Jail designed by John Haviland and built in 1848 possessed all the aspects of a castle with high ramparts and parapets for the archers. When society moved into the present century the earlier fortress-type prisons gave way to new forms more expressive of less punishment and a tendency toward reformation. The new reformatory in Moberly, Missouri, has all the outward appearance of a two-story wheel-shaped ranch house sometimes found in Western states.

In spite of this humanitarian influence the 'dead hand of the past' rests very heavily upon some of the prisons and jails in the country. It is true that the infamous Bastille of Paris, built in 1369 and razed by the citizens after the French Revolution because of all that it symbolized—brutality and injustice—, no longer exists. The former site is now marked by a huge column and the area is known as the Place de la Bastille. Likewise, it is true that the eighteenth-century convict ships no longer transport prisoners to various penal colonies in remote parts of the globe. However, there still remains in mid-America one of the most unusual penological tools for the incarceration of prisoners—The Human Squirrel Cage, The Rotary Jail, or what sometimes has been called The Lazy Susan Jail.

The rotary jail in Pottawattamie County, Iowa, an ingenious bit of penal architectural engineering, became known to the writer in the course of a series of inspections and visits to jails and prisons in the west-central part of the United States in 1948 (fig. 1). The rotary jail is officially known as the Pottawattamie County Jail located in Council Bluffs, Iowa. It was built in 1885 and except for a few details of sanitation and the heating system the structure remains and operates as originally designed. To date no drawings have been found in the county archives or the files of the contractors, the Wickham Brothers of Council Bluffs, Iowa, or the architects, the firm of Eckel and Aldrich of St. Joseph, Missouri. Because of the absence of plans and drawings of the jail, James Yusas, a student at Iowa State College, and the writer made detailed measurements of the interior construction of the jail and the rotary unit. The drawings presented here show the general design and measurements of the interior of the squirrel cage jail. Due allowance needs to be given for possible errors in exact measurement because of the inaccessibility of certain parts of the structure, but the drawings do show the over-all plans.

1. Jail in Council Bluffs, Iowa (photo: author).

2. Jail in Maryville, Missouri (photo: author).

Not long after completion of the drawings of the Pottawattamie County Jail it became known that there was another rotary jail some seventy-five miles distant in Maryville, Nodaway County, Missouri (fig. 2). Examination of this jail revealed that both structures were identical except for minor details and size. The Maryville jail contained two decks or levels whereas the Pottawattamie jail was larger, with three levels. The Maryville jail had a metal plate on the huge drum from which it was possible to make out the names of the patentee and the designers. This plate bore the names of W. H. Brown, patentee, and Haugh, Ketcham Company, designers, both of Indianapolis, Indiana. The United States Patent Office supplied copies of the original letters patent dated 12 July 1881. The letters patent contained drawings together with a detailed explanation of the rotary jail. Further search revealed that at least four other rotary jails were built in the Midwestern states during the 1880s: the DeKalb County Jail, Maysville, Missouri, built in 1885 but dismantled in 1938; the Daviess County Jail, Gallatin, Missouri, built in 1888; the Montgomery County Jail, Crawfordsville, Indiana, built in 1882; and the Sedgwick County Jail, Wichita, Kansas, built about 1884 or 1885 and dismantled in 1919 or 1920.

Only four of the original rotary jails remain in use. The Maysville jail was dismantled in 1938 when the county built a new courthouse. The Wichita jail was dismantled sometime in 1919 or 1920 due to popular complaint. Because these six jails were constructed after the same general design, with some minor variations, the detailed description will be limited to the Pottawattamie County Rotary Jail. The five other jails will be described briefly.

The exterior structure housing the rotary jail unit consists of a three-story brick building which has the over-all appearance of many carriage houses or barns built in the United States during the 1870s and 1880s. The front one third of the building provides quarters for the jailer's family and the kitchen for the prisoners. Part of the second floor is set aside for individual cells for women and juveniles. The third floor contains small rooms used for storage and mechanical parts for the supporting axle of the rotary structure.

A large room, thirty-six by thirty-six feet and twenty-eight feet high, in the rear portion of the building, houses the rotary unit and the cage (fig. 3). This consists of a giant gridded, stationary, cylindrical enclosure or cage bolted to the flagstone floor and the iron plates in the ceiling. Inside this outer gridded drum is an inner rotary cylinder divided into three levels or decks each segmented into ten pie-shaped cells. Figure 4 shows the inner and outer shells together with the cells. The inner cylinder is constructed around a central axis which rests on bearings at the base with a supporting collar in the third floor. There is one door at each level in the outer shell. Each cell in the inner drum has a doorway but no door. Entrance is gained to respective cells by rotating the inner cylinder opposite the single door in the outer stationary cylinder. Each radial cell is made of iron plate and contains double bunk beds. At the apex of the cell or the center is a recessed toilet seat which at one time had a flushing system with water from pipes fixed in the central core of the structure (fig. 5). Each cell is about eight feet high and seven and one half feet deep to the center. The bars in the outer stationary gridded drum cover the doorway to

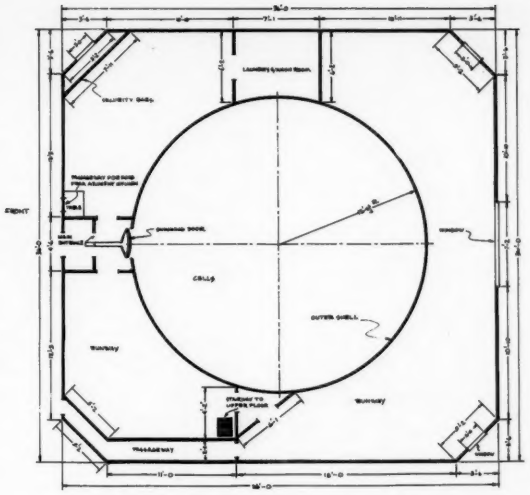
each cell in the revolving cylinder. The radial cells make it impossible for prisoners to see inmates in other cells around the inner drum.

The inner cylinder with the cells is built around a central axis surrounded by a large pipe or tubing. The main axis rests in a huge collar in the floor. The collar in the third floor gives support to the top of the axis. In order to keep the cylinder in proper alignment large, iron, inverted casters beneath the first floor render general balance during rotation. Power for rotating this inner cylinder upon the axis and casters arises from a hand cranking device located in a small tank-like room outside the area in which the unit is located (fig. 6). Power from this hand crank is transmitted to a huge ring gear around the base of the inner cylinder by means of pinions and gears underneath the floor. One man is able to turn the crank in order to revolve the cylinder. In the original letters patent dated 1881 the description stated that the inner cylinder may be kept 'in continual rotation during the night, or at any other time when the prisoners cannot be conveniently watched, and thus prevent any attempt on their part to cut their way out at such times'. The original plans did not show the details, but provisions were made for continuous rotation by means of 'a heavy weight or spring, the operation of which could be regulated by clock-work or other similar mechanism', much after the fashion of the early weight-driven clocks (figs. 7 and 8). For some reason this weight and spring device was not used in the jail. Another advantage of the rotating cell was the fact that a jailer could inspect all cells from a single vantage point while the cylinder revolved.

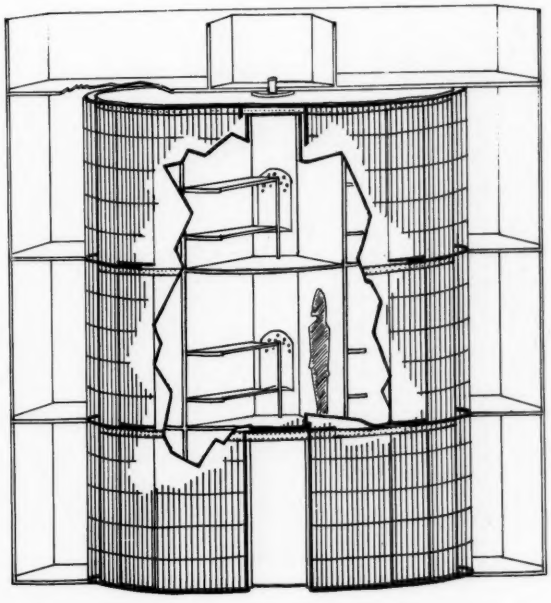
In order to make the jail secure there was but one main passageway from the outside entrance to the inner circular cage (figs. 5 and 6). Each prisoner entered through a heavy, screened, sliding door to pass into the small tank-like room. Opposite the sliding door is an ingenious swinging door built on a vertical rocker arm with segmental gridded frames at the opposite end reaching from the floor to the ceiling. When in position one end of the segmental door secures the doorway into the outer stationary shell surrounding the inner cylinder. In order to open the passageway the rocker or pivoted door is swung to right or left, which opens both entrances. In this position the prisoner may be taken to his cell or conducted into the exercise room surrounding the great outer stationary shell. After passage has been gained the rocker arm device is swung back into position and secured by means of heavy locks secured to the lever and the doorway frame.

The rectangular bars in the outer shell measured two and one half inches by one half inch with three and one half inches between bars. These heavy bars are ribbed with horizontal bars of the same size one foot three and one half inches apart. They are considerably heavier than bars used in cages for African lions or Kodiak Alaskan bears.

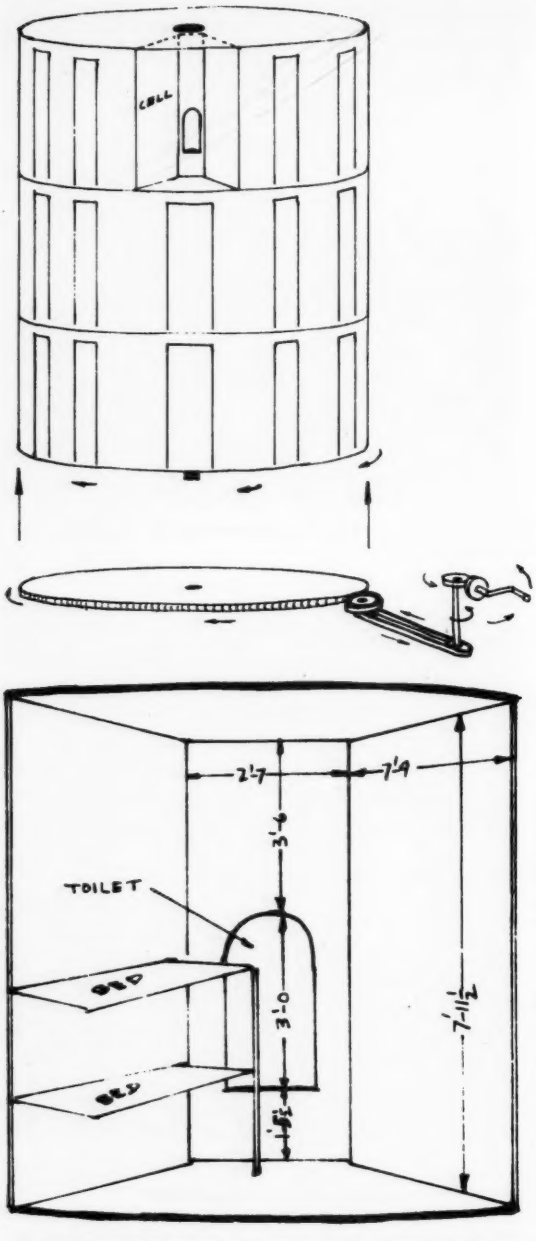
Around the giant outer shell within the huge room is a flagstone runway which serves as a general day room for prisoners (fig. 3). The area provides dining, laundry, and bathing facilities as well as benches and tables. The daily rations of food are passed through a small opening from



3. Ground plan, jail in Council Bluffs, Iowa. The main entrance allows prisoners to pass to cells or to runway. The jailers' quarters at front are not shown.

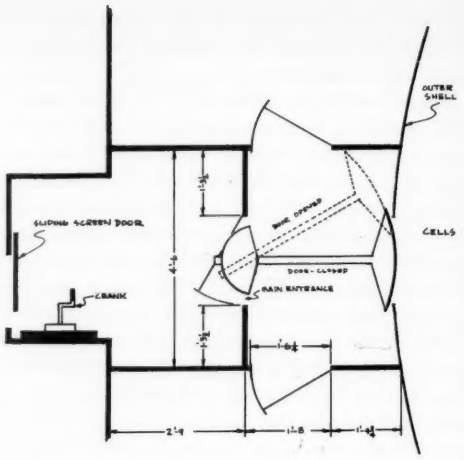


4. Drawing showing the interior of jail in Council Bluffs, Iowa. An outer stationary gridded shell surrounds the inner revolving cylinder which has three levels with ten radial cells on each deck.



5. Cranking mechanism and cell interior, jail in Council Bluffs, Iowa.

the kitchen in the front of the room near the main entrance. The day room has three corner windows and one main window in the west wall. The windows are carried to the ceiling with openings in the floors. Each window is covered by a double set of steel bars made of hollow steel piping with an inner steel rod. Originally this inner rod was designed to revolve to prevent sawing through the steel pipe.



6. Door mechanism, jail in Council Bluffs, Iowa.

Under normal conditions the rotating unit may house sixty prisoners with two to a cell and twenty on each level. However, in 1929 during a local disturbance 165 men were held in the jail for a short period of time. In recent years the jail has seldom housed more than twenty-five prisoners.

Just why the inventors created the rotary principle in the jail may not be known for the present. It is known, however, that round or circular prisons of the stationary type with cells in the outside walls had been designed and built in Europe as early as the last decade of the eighteenth century. Jeremy Bentham devised the famous panoptican prison in England in 1791. In 1800 Benjamin H. Latrobe built the State Prison in Richmond, Virginia, which was a modified plan of Bentham's panoptican. Later in 1826 the Western Penitentiary in Pittsburgh was built as a true panoptican structure. The present State Prison in Statesville, Illinois, with four circular buildings was built in 1919 upon the panoptican plan. Each of these prisons was a circular structure, but none used the principle of an inner rotary cell unit. The modification of the earlier panoptican stationary system into the revolving cylinder with prisoners in the center constituted an unusual change in penal architecture which is very difficult to explain, especially since the cell block design had already been adopted in various parts of the nation. Some county jails had used the square cage plan within a large room but at no time had the rotary element been applied. It is possible that the squirrel cage revolving jail may be an evidence of how humanitarian principles in penology had failed to keep pace with architectural designing. The rotary jail appears to be a device in which human welfare had been sacrificed for security and the convenience of the jailer.

If Arthur Hopkins (1870–1941), the leading American prison architect, who said that the Illinois Prison at Statesville had 'the most awful receptacles of gloom which were ever devised and put together with good stone and brick and mortar', could have seen the rotary jail he might have been appalled. He wrote, 'I have always felt that the employment of this excess of tool-proof metal to be the most absurd of all our ill-considered prison construction. . . . To build an entire institution on the basis of its worst possible inmates is nonsense'.[1]

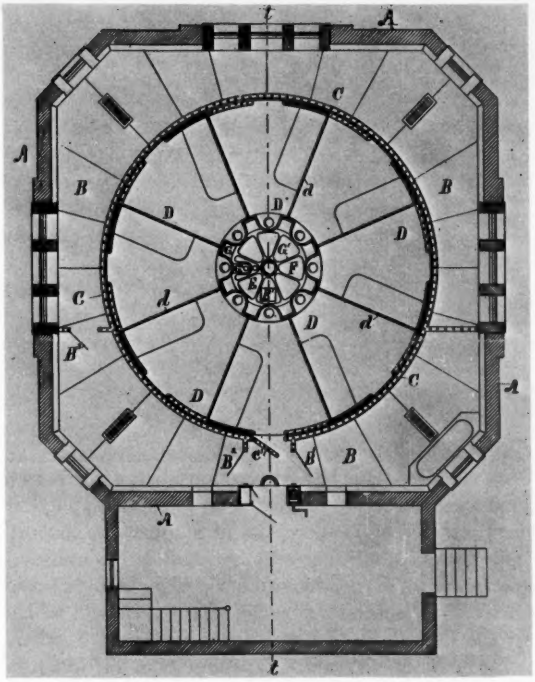
In the letters patent number 244,358, W. H. Brown and B. F. Haugh, filed in the United States Patent Office 12 July 1881, the inventors together with John L. Ketcham set forth their specifications and description of the rotary jail or prison.

> The object of our invention is to produce a jail or prison in which prisoners can be controlled without the necessity of personal contact between them and the jailer or guard, and incidentally to provide it with sundry conveniences and advantages not usually found in prisons.
>
> Attention is called to the fact, in this connection, that the construction of the cells is such that the prisoners cannot communicate with each other in any way, and therefore that any concert of action between them would be extremely difficult.
>
> The prisoners are handled without any possible chance of personal contact with any except the one desired, as the cell structure is rotated until the door opening of the cell desired is brought opposite the general door-opening in the outside grating, and while one cell occupies this position the rest must of necessity be securely closed. This arrangement makes the whole prison as convenient to the keeper as though it consisted of but a single prisoner.

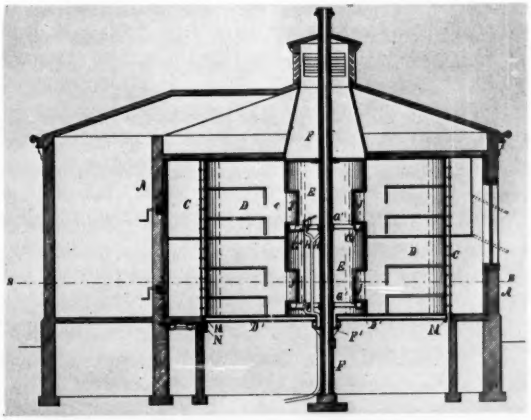
In considering the unusual design and construction of the rotary jail the observer naturally wonders what brought the Board of Supervisors of Pottawattamie County to construct such an instrument for incarceration. Original records are not available and it is difficult to conjecture just what may have been the thinking of the governing body to adopt the rotary jail. A few conditions, however, are known which may have played a part in their actions.

The years following the Civil War, in the 1870s and 1880s, were troublesome days in certain sections of the Midwest. In the ten-year period from 1860 to 1870 mob violence appeared in several settlements in Iowa with the result that sixty persons were lynched. Council Bluffs, on the east bank of the Missouri River, was in the main line of traffic to the West. Wagon trains and travelers passed through the town moving westward to seek new lands or to prospect. Most of these were home seekers but a few were not. Some were soldiers of fortune and others were men who had left the East for various reasons. The new railroad brought numerous changes in rapid succession. The population of Council Bluffs increased from 16,893 in 1870 to 39,846 in 1880. The old wooden jail built in

1. Arthur Hopkins, *Prisons and Prison Buildings* (1930), pp. 46–47.



7. Plan of rotary jail in letters patent of 12 July 1881. (A) Outer wall of brick with barred windows. (B) Runway or exercise room. (C) Heavy gridded stationary outer shell. (D) Inner cylinder with radial cells. (d) Iron plate partitions between cells. (E) Iron plate unit with flue from stove in basement, water pipes, and air shaft. (F) Flue. (G) Annular basin for recessed toilet.



8. Section of rotary jail in letters patent of 12 July 1881. (C) Outer stationary gridded shell. (D) Cells. (F) Flue for stove in basement. (G) Annular water basin, attached to central plated shaft. (H) Soil pipes for sewage disposal with valve operated by cord running to basement. (J) Recessed toilet seats. (M) Large ring gear attached to base of inner cylinder. (N) Pinion gear driven by hand crank operated from front of large room.

1862, known as the Cottonwood Jail, was no longer usable. Furthermore, county records and newspapers report the increase in murders, arson, and certain crimes of violence which had been rare in earlier days. During the second post-war depression, 1874–1878, criminal court cases in Iowa increased rapidly. As further evidence, the State Legislature reinstated capital punishment in 1878 after it had been abolished in 1872. Jesse James (1847–1882), who had been a member of a Confederate guerrilla band, and his followers overran Missouri, Iowa, and parts of Minnesota. Frank James at one time had been held and tried in Gallatin, Missouri, but acquitted after an appeal by his commander, an officer in the Confederate Army. There was, therefore, serious need for a secure jail to keep inmates in, and others from breaking into, the jail.

In December 1884 the County Board of Supervisors was confronted with the problem of building a new jail. The old Cottonwood Jail had been condemned. As early as 9 June 1882, the Board had had a set of plans supplied by the Eckel and Mann Company of St. Joseph, Missouri. 'Said drawings to be agreeable to the Board in every respect. Said jail to have acomadions [sic] for eighty prisoners. Said jail to be built after the Patent of Haugh, Ketcham and Company and known as the rotary jail. . . . Said jail to be in no wise inferior to the jail and sheriff's residence built in Crawfordsville, Indiana, by Haugh, Ketcham Company.'[2]

Later in February 1884 the Board met with the architect from the Eckel and Mann Company and delegates from various townships to take action for building the new jail. As of that date the Board accepted the plans submitted by the Eckel and Mann Company 'as being in their opinion the best adapted for the use of the county'. The acceptance of the rotary jail plan by the Board appears to have been influenced by the fact that the same firm had already built a rotary jail in Maryville, Missouri. Furthermore, it seems that the authorities were in 'desperate' need for some kind of a 'proper' jail, and that the contractors had what they thought to be the answer to the problem regardless of the welfare of the inmates or the hazardous nature of the design.

Considering the nature of the jail and the amount of steel and iron plate used, the construction of the building was rapid. On 10 September 1885, the building was completed and all the fifteen prisoners in the old Cottonwood Jail were transferred to the new jail. The Council Bluffs *Globe* reported the occasion with a descriptive article dated 11 September 1885.

Thus was put into operation one of the most ingenious jails in the country. The *Globe* reported the cost of the building at $7,350 and $21,000 for the steel and iron work which had been supplied by the Haugh, Ketcham Company of Indianapolis, Indiana. Various types of work on the building were sub-let as follows: cornice and roofing, John Epeneter; painting, B. Terwillinger; carpentering, G. S. Lawson; and mason work, Wichham Brothers of Council Bluffs.

Within two years after construction, the giant rotary jail proved to be unsatisfactory because the inner drum failed 'to scour'. The *Globe* on 18 March 1887 reported as follows:

> The fact need not be concealed that the new county jail is pretty near a failure. The great revolving cylinder which contains most of the cells in the building does not work on its axis with satisfaction. It is thought by some of our officials that although this drum may be made to work for quite a while yet—possibly for years—it is a failure. It is not exactly in harmony with the building nor with itself. The time may come when it will be taken out, for it cannot be used as a stationary apartment of cells. It is so large and heavy that it does not sit gracefully on its foundation. In fact, it don't scour. If it should be taken down and apart, and removed from the jail, we would still have a jail left though not a very serviceable one. It is rumored that the revolving jail at Maryville is working badly—also that some prisoners have escaped therefrom. It would be a difficult task for a mechanic to reconstruct our jail and supply it with stationary cells—yet it could of course be done. New things are dreadfully uncertain, like most old ones. It is possible that there may be a poor, wise man somewhere in Council Bluffs who has time to revolve this cylinder in his mind until he can tell what to do with it—if not we will have to refer it to a Philadelphia lawyer, knowing that what he don't know is beyond human wit.

Three years after the completion of the county jail, 'One of the boldest and most successful jail deliveries on record in the state occurred in this city at about 4 o'clock yesterday afternoon, when eleven prisoners cooly walked out the front door of the county jail and took their immediate departure without interference from anyone'.[3] The prisoners effected their escape by filing the lock on the door leading from the exercise room to the back corridor. From here they climbed up the grating of the outer shell to the third floor and walked out through an unlocked front door. As a result of the escape Sheriff O'Neill was criticized for 'grossest negligence'.

Apart from the mechanical difficulties the county jail proved hazardous for the prisoners. Almost without exception month after month prisoners received broken arms, legs, a foot or hand caught between the bars during the revolving of the cylinder. Over the years the respective county sheriffs complained to county officials about the conditions, and various grand juries in their annual reports have condemned the building but as of the present, the rotary jail is still being used in Council Bluffs.

The information relative to the two dismantled jails, one at Maysville, Missouri, and the other in Wichita, Kansas, while limited, is sufficient to verify the fact that they

2. From minutes of the County Board of Supervisors of Pottawattamie County, supplied by Mrs. Elsa L. Jackman, Public Library, Council Bluffs, Iowa.

3. *The Daily Nonpareil* 6 December 1888, p. 5.

were constructed as were the other four rotary jails. The design of each followed the general specifications outlined in the letters patent of W. H. Brown in 1881.

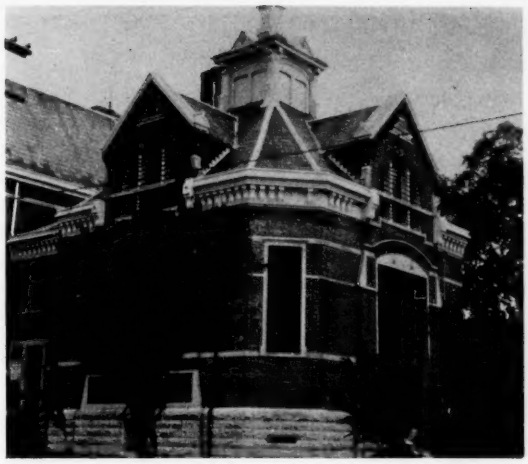
It is evident that the rotary jail in Crawfordsville, Montgomery County, Indiana, was the first rotary jail to be constructed; although the authorities in Crawfordsville differ as to the exact date of construction, it must have been built about 1882 (fig. 9). The exterior building of the jail follows the same general plan of the Council Bluffs jail except that the living quarters for the sheriff are larger. The firm of C. A. Hoffman of Cincinnati, Ohio, built the jail from the plans furnished in the letters patent by W. H. Brown.[4] The Haugh, Ketcham Company of Indianapolis, Indiana, supplied the steel and iron work for the structure. Originally the rotary unit contained three levels or decks but at present only two are being used. The upper level has been sealed off and is used for storage purposes.

Like the Council Bluffs jail, mechanical difficulties developed in the rotary cylinder. Shortly after 1910 respective grand juries complained about the jail and various fire marshals registered objections because of the fire hazard. In 1938 the rotary cylinder was welded to the stationary outer shell and doors were cut for each of the pie-shaped cells. A circular catwalk was built around the second level to provide access to the cells. As of 1957 when the writer visited the jail the entire structure had been renovated by Sheriff Remley with modern plumbing and heating systems. The huge gridded cylinder still has the appearance of a huge squirrel cage, but the hazards of the rotary unit have been eliminated.

The county jail in Maryville, Nodaway County, Missouri, was built in 1882 at a cost of $19,400 (fig. 2). The structure contains the sheriff's living quarters and the jail proper. The firm of F. C. Allen built the jail under the directions of the architects Eckel and Mann of St. Joseph, Missouri. The metal plate at the entrance contains the names of the patentee, W. H. Brown and Haugh, Ketcham Company of Indianapolis, Indiana, who supplied the steel and iron work. The rotary unit consists of two levels with eight pie-shaped cells on each deck.

Not long after the completion of the jail certain mechanical difficulties developed in the gears making it difficult to rotate the inner cylinder. The late Sheriff Earl M. Brown reported at the time of the inspection that the unit had failed 'to scour' and that on certain occasions the prisoners 'rocked' the inner cylinder making it impossible to revolve the huge cylinder. In 1904 a prisoner, Charles

4. Sheriff Merle Remley gave the date of 1885 as did R. E. Banta but T. G. Grovert set the date as 1882. Furthermore, the minutes of the Board of Supervisors of Pottawattamie County, Iowa, date 9 June 1882, state that 'said building to be in no wise inferior to the jail and sheriff's residence built in Crawfordsville, Indiana, by Haugh, Ketcham and Co.'



9. Jail in Crawfordsville, Indiana (photo: author).

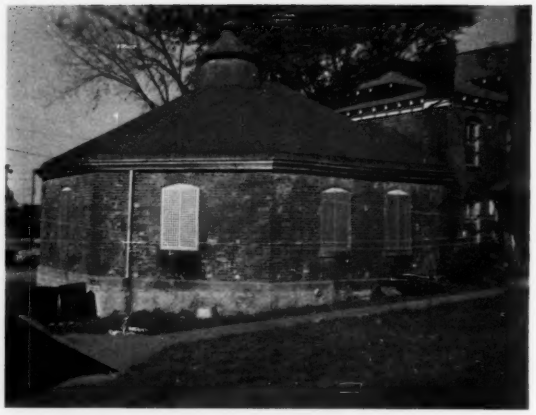
Fry, was killed when his head was crushed between the inner and outer grids while the cylinder was being revolved. Shortly after this incident the inner cylinder was 'frozen' to the base and doorways cut into the outer shell. The second level was enclosed leaving but one deck for sixteen prisoners, two to each of the eight cells. When the jail was visited in 1957 the entire structure was being renovated and modern plumbing and heating systems placed in the buildings. At present the huge circular gridded cage remains within the large room. The sheriff indicated that various attempts had been made to raze the building, but without success.

The Daviess County Jail in Gallatin, Missouri, was built in 1888 by the B. Pauley Jail Building and Manufacturing Company of St. Louis, Missouri, after the design of the patentee, W. H. Brown (fig. 10).[5] The entire cost of the jail and the sheriff's apartment amounted to $12,000. This jail is identical to the other rotary jails except for some minor changes in the locking device, the gear mechanism, and the fact that it has only one level or deck with eight cells. At the time of the inspection Sheriff L. H. Houghton explained that the rotary mechanism was still usable, but in need of repairs. However, the county had so few prisoners that there was no need of more than one cell at a time—one solitary 'drunk' at the time of the visit. In common with other counties in northern Missouri, Daviess

5. The plate on the inner wall of the jail indicated that four patents had been filed subsequent to the original letters patent.

Patent Number 244,272 August, 1881
Patent Number 344,242 ? 1883
Patent Number 377,402 ? 1886
Patent Number 360,205 August 5, 1887

Many coats of paint made the exact deciphering of numbers and dates difficult, but the above appears to be correct.



10. Jail in Gallatin, Missouri (photo: author).

County has lost considerable population in the past twenty-five years. The county has been the scene of much local color. Frank James, the brother of Jesse James, was tried and acquitted in the old courthouse in Gallatin shortly after the Civil War.

The DeKalb County Jail in Maysville, Missouri, was built in 1885 by the firm of Eckel and Mann of St. Joseph, Missouri, after the same design of the letters patent of W. H. Brown. The jail and living quarters for the sheriff were constructed as a part of the courthouse at a total cost of $32,000. The jail remained in use until 1938 when the county constructed a new courthouse with the jail on the third floor. Sheriff O. L. Maddock and Robert Daniels, who served as sheriff from 1933 to 1936, described the general plan of the jail to the writer at the time of the visit to Maysville in 1958.

The data on the rotary jail in Sedgwick County, Wichita, Kansas, is not complete because the information has been limited to secondary sources of letters and a single publication. However, there are enough facts to establish the certainty that there was a rotary jail in Wichita and that it was constructed after the same general plans of the other rotary jails. As near as can be learned the jail was built sometime between 1884 and 1887, and remained in use until about 1919 when it was dismantled because of public protest. Librarian Ford A. Rockwell of the Wichita City Library stated that the rotary jail was built because the earlier jail had become unsatisfactory. 'The first jail was a building of cottonwood two by fours built in the early 1870s. In its narrow confines of six by eighteen feet as many as forty law breakers were kept at one time, largely cowboys who had shown too much exuberance upon reaching town.' Rockwell describes the jail in the following manner.

> The rotary jail was a series of cells within a brick building. These cells were iron barred and the total construction of them was in the form of a cylinder which rotated on an axle. The rotation was, of course, to turn all the cells around at one time and away from one exit door. I was informed that each local rotary jail could house about sixty inmates. There were two levels and, until I can actually find a written account of, possibly a third level. There was a catwalk around the cells and the prisoners were given food through the bars or little trap opening. Though this form of jail was very secure against escape the great argument for its disuse was that it was a human firetrap.[6]

During the labor troubles in Kansas in 1917 Ellen Reeve Bloor, a labor leader, describes the Wichita jail when she visited some of the imprisoned laborers.

> . . . all were immediately arrested and locked up in the Wichita jail, one of the worst I have ever seen. The cells were angular cubicles, shaped like pie-cuts, rotating around a piston in the center, keeping the prisoners exposed through the grating and in continual motion. The guard was able to stand still and watch them as they moved. All sense of human dignity was murdered in that place.
>
> On my first visit there, one of the boys warned us: 'Don't stand near the walls anywhere, they are alive with bugs.' One of the men in that prison went insane. Another died.[7]

The invention, acceptance, and construction of the six rotary jails in the four Midwestern states in the last quarter of the nineteenth century presents an unusual situation in the annals of penology. Two questions arise from the origin and the diffusion of this bit of mechanical engineering tool for the incarceration of offenders. One question has already been mentioned but not answered. How did it happen that such a device could have appeared as it did and gained acceptance when it did? Could it be that the architects and engineers who created this mechanical device had become so involved in technology as to lose sight of the welfare of the men to be housed in the cage? If the plans of a building record fairly accurately the cultural level of a people, what can be said of the inventors and the people who accepted the plan? Was it but an abortive or awkward architectural device that grew out of the fast-moving frontier society which had been driven by necessity to cope with the problem of crime? Or shall the rotary jail be looked upon as one of those social monstrosities that has arisen from time to time amid the urgency of an ever-changing society? To some it may appear not unlike some of the social developments and events that arose during the war between the states. Maybe the mechanical ingenuity which created the rotary jail is but a part of that same skill which had constructed the man-of-war the *Monitor* with its revolving turret and the rotary action of the Gatling gun adopted by the United States Army after the end of the Civil War.

Ultimately the rotary jail was but the application of applied science to a specific problem—the housing of offenders. From a functional viewpoint in architecture the

6. From a letter dated 13 August 1958.

7. Ellen R. Bloor, *We Are Many* (New York: International Pub., 1940), p. 154. Quoted with kind permission of the publisher.

question may be asked, was the human squirrel cage good architecture? Was it a superior tool in human engineering? The only criterion which can be used in answer to the question is the same which is applied to any structure; was it an instrument for general well-being and good health? In reality the rotary jail was a penological tool to contain the damned as the guillotine was a tool to execute the condemned men. If it may be assumed that the jail was good for the community, and this is difficult, it certainly was not for the general good and health of the prisoners. From this it appears that the mechanical engineers and the architects may have lost sight of the basic function of a building. It further appears that good architecture had been sacrificed on the altar of the technician. P. Youtz has pointed out that 'where a superior architectural instrument exists, it encourages men to great accomplishments. Awkward tools produce ignorant men. The tool becomes the tutor of its possessors.'[8] Considering the character of the rotary jail it is very difficult to see how the structure could encourage men 'to great accomplishments'. Furthermore, if 'the tool becomes the tutor' what has the rotary jail taught the condemned men housed in it and the citizens who have lived in the community? Subsequent developments afford the best answers: the condemnations of later grand juries, the repeated complaints of various fire marshals, and the maiming of inmates. Men in the Council Bluffs jail have stated to the writer that they would rather serve a three- or five-year sentence in any other jail than to spend one year in the squirrel cage.

Finally consider the second question—how to account for the diffusion of the rotary jails across the four states in mid-America. No complete and final answer can be given because it is not possible to go back in time to know all the steps or phases in the process. It is quite clear that the various territories in which the jails were built were being settled rapidly by all types of people following the years of the Civil War and the expansion of the railroads to the West. Again, it is known that certain kinds of lawlessness had arisen in these areas. Furthermore, the earlier buildings which had been built to incarcerate offenders were no longer serviceable. Records in four of the counties reveal that the earlier cottonwood jails were unsanitary and no longer secure. In spite of what may appear as objectionable, the rotary jails did meet both of these requirements for they were secure and much more sanitary than anything developed thus far. In addition to steel bars the jails had running water and a type of central heating—two of the new comforts of the day. Security now appears to have been more of a promise than an actuality, but the jail was safer than the older cottonwood structures built prior to the Civil War.

As for the acceptance of the rotary jail in Crawfordsville the question seems to be one of proximity to the location of the engineers and the inventor, who were located in Indianapolis, Indiana. In addition, Montgomery County needed a new jail. Just how the rotary jail moved westward into Missouri, Iowa, and Kansas cannot be explained apart from the usual communication which takes place between technical men at any time. How much promotion may have gone into the spread of the rotary jail cannot be known, but this element should not be overlooked.

Just why the rotary jail was adopted in the counties of Missouri, Iowa, and Kansas, and not elsewhere in the nation, may be due to the fact that the jails east of the Mississippi River may have been considered adequate. Furthermore, the Eastern states had not been confronted with the lawless raids of bank and train robbers as in the case of the James Brothers and others. In the territories beyond the Missouri River the country was still very largely unsettled with no urgent need for jails. There were other ways of dealing with outlaws such as the hangman's tree, and the West was relatively open country. A final fact is the hazardous nature of the rotary jail.

8. P. Youtz, *Sounding Stones of Architecture* (1929), p. 77.

AMERICAN NOTES

Peter Harrison Addendum

CARL BRIDENBAUGH

The author of *Peter Harrison, First American Architect*, published by the Institute of Early American History and Culture (Williamsburg, 1949), has collected several important bits of further information that we are glad to post here. Our readers will be glad to know that more copies have recently been bound and are for sale by the University of North Carolina Press ($3.50). Mr. Bridenbaugh is now at the University of California, Berkeley.—Ed.

Peter Harrison in South Carolina, 1742

When Harrison visited Charles Town in 1742, he became acquainted with Gabriel Manigault, treasurer of the province of South Carolina, who, at that time, was engaged in systematizing the accounts of the expedition of 1740 against St. Augustine. Having been entertained 'with much Civility' by Manigault, the young sea captain obliged him by preparing 'A Plan of the Harbour of St. Augustine and the Adjacent Parts in Florida representing the Field of Action with the Dispositions of the Forces before that Castle in the Expedition under General Oglethorpe in 1740'. This map, engraved by a Charles Town silversmith, Moreau Sarrazin, was published in *The Report of the Committee of Both Houses of Assembly of the Province of South-Carolina Appointed to enquire into the Causes of Disappointment of Success, in the Late Expedition Against St. Augustine, Under the Command of General Oglethorpe* (Charles Town: Charles Timothy, 1742). In the lower left-hand corner of the map appears the legend: 'P Harrison Del[r].' Thus, it is evident that his skill as a draftsman became well known to Charlestonians by 1742.[1]

Harrison's Domestic Houses

Absence of reliable documentary evidence that Harrison designed private houses has led to many conjectures, the most plausible of them being based on the use of 'Pine Plank in imitation of Rustick' such as the architect employed at the Redwood Library.[2] It is now possible to state confidently that he designed at least two more dwellings besides the Wentworth House. 1. *Leamington Farm.* The account books of John Stevens, Newport stonecutter, owned by the late John Howard Benson of Newport, show that Harrison's own house on Leamington Farm was being erected in 1747.[3] 2. *Winthrop House, New London, Conn.* Joshua Hempstead made the following entry in his *Diary*, 17 April 1752: 'Went to assist in the measuring the Neck that was Mr. Winthrops. Capt. [Peter] Harrison from Newport is making a Plan &c.' This was the dwelling that John Still Winthrop (1720–1776), now an Anglican, had his fellow-churchman Harrison design for him and his bride, née Jane Borland of Boston. On 6 August 1754, Farmer Hempstead reported: 'In the aftern I went up to Mr Winthrops with Mr. Miller to see Mr. Winthrops great house Raised and Stayed till night. There were a great many People and many Spectators besides Labourers. they finished the Body of the House all but the Roof.' It appears that Thomas Spooner moved from New Bedford to New London for 'the express purpose of superintending the erection of the house.' He may have been of the same family as Wing Spooner, one of the builders mentioned in the contract for the Redwood Library.[4]

1. J. H. Easterby of the Historical Commission of South Carolina thoughtfully drew my attention to the Harrison 'Plan'. I have used the copy in the Newberry Library. The map is reproduced in J. H. Easterby, ed., *The Journal of the Commons House of Assembly [of South Carolina], May 18, 1741–July 10, 1742* (Columbia, 1953), p. 93; Bridenbaugh, *Peter Harrison: First American Architect* (Chapel Hill, 1949), pp. 15, 31; *Dict. Amer. Biog.*, XII, 234.

2. Hugh Morrison has suggested that Harrison 'may have been primarily responsible' for the adoption of the questionable vogue of rustication in the colonies. *Early American Architecture* (New York, 1952), pp. 449–450.

3. Mrs. Downing also attributes, on the authority of a statement of 1832, the Collector Charles Dudley House and three other rusticated Newport dwellings to Harrison. Antoinette Downing and Vincent J. Scully, Jr., *The Architectural Heritage of Newport* (Cambridge, 1952), pp. 81–82.

4. *Diary of Joshua Hempstead of New London*, New London County Historical Society, *Collections*, I (1901), 58, 434; Lawrence S. Mayo, *The Winthrop Family in America* (Boston, 1948), pp. 160–161; on Spooner see letter of Mrs. Dwight C. Lyman, Old Lyme, Conn., to Carl Bridenbaugh, 8 December 1955; Bridenbaugh, *Peter Harrison*, p. 186.

The Mason's Hall, Newport

In *Peter Harrison*, plans for 'a Mason's Hall' were attributed to Harrison on the slender evidence in the Rev. Andrew Burnaby's *Travels*.[5] This conjecture is now confirmed by the original records of St. John's Lodge, which contain the following entries:

July 6, 1759. 'Voted that it be left to the Committee whether they proceed in the building of Masons [Hall] either with wood or Rustick work or with brick, whichsoever they shall find cheapest.'

August 20, 1759. At noon the cornerstone was laid.

March 20, 1760. 'Voted that twenty five Tickets in the M[asons'] H[all] Lottery be given to Cap Peter Harrison for his Trouble drawing the Plan of Masons Hall.'[6]

November 27, 1765. No building yet erected on the foundations.

Corrections

Three errors noted in *Peter Harrison* are hereby gratefully acknowledged and corrected.

1. p. viii. Thomas Jefferson did visit Newport, R. I. June 12–14, 1784.

2. p. 67. Prior to the erection of St. Michael's Church, there were two ecclesiastical edifices with colossal porticoes in South Carolina: old St. Philip's, Charles Town, which Harrison saw and an engraving of which he may have possessed among his *Gentleman's Magazines*; and the Prince William parish church at Sheldon, which he may have known.[7]

3. p. 147. Wentworth House has a 'hip' roof, not a 'gambrel', as stated.

5. Bridenbaugh, *Peter Harrison*, pp. 104–105.

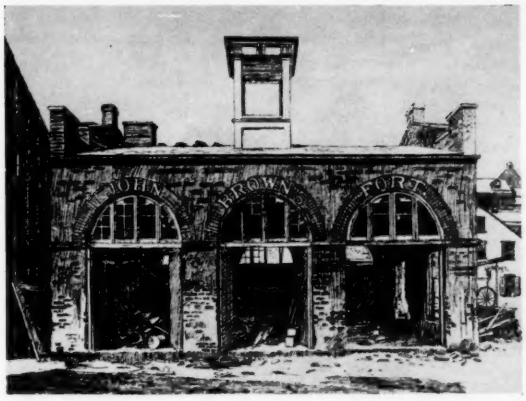
6. Transcripts of the Masonic records kindly copied for the author by Mrs. Peter Bolhouse at the Newport Historical Society at the request of Leonard Panaggio.

7. Unsigned review in the *News and Courier*, Charleston, S. C., 22 May 1949. The late Fiske Kimball and Mrs. Dwight C. Lyman gave me much valuable assistance which I desire to acknowledge here.

John Brown's Fort in Chicago, 1893

Just a hundred years ago, 18 October 1859, Robert E. Lee and a detachment of United States Marines seized Abolitionist John Brown and his desperate little band holed up in the fire engine house of the United States Arsenal at Harpers Ferry, West Virginia (fig. 1). Soon afterwards Brown was tried and hung, but in the words of the famous song, 'his soul goes marching on'. The abortive effort to set free the Negro slaves helped trigger the Civil War and the little brick Fort became a famous landmark. What happened to it later deserves mention in the annals of historical preservation.

Seymour R. Frolichstein and Russell V. Keune, architectural students at the University of Illinois, worked for the National Park Service at Harpers Ferry in the summer of 1958. They became interested in the much-travelled Fort, found out how it got to Chicago during the World's Columbian Exposition, and sent us the following information.—Ed.



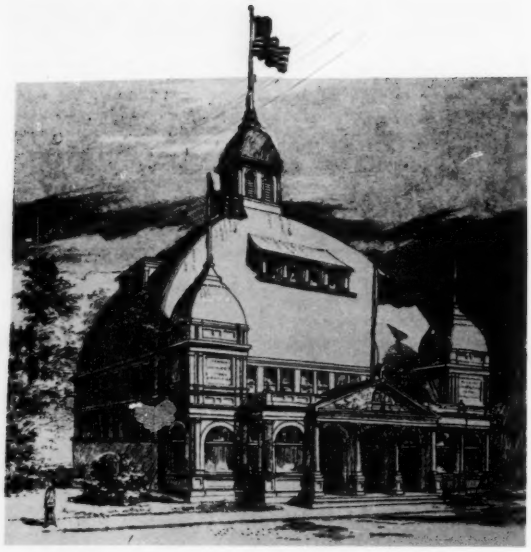
1. John Brown's Fort on original site, Harpers Ferry, West Virginia (from *The Graphic* 1892).

John J. Flinn, *Standard Guide to Chicago* (Chicago, 1893), p. 132, gives the following account:

Location 1341 Wabash Avenue. The little brick building which John Brown defended as a fort bravely but hopelessly in 1859 against the combined forces of the government and the State of Virginia. Enclosed in a frame building that is of a novel design, this almost sacred relic of days just preceding the civil war may be seen. The fort was moved here principally through the instrumentality of Ex-Congressman A. J. Jolmes, of Iowa, who has served as Sargent-at-arms of the House. The building was purchased by a syndicate after much difficulty, as the people of Harper's Ferry were unwilling to part with it. Before the removal, the building was torn down with the utmost care, the various parts were boxed separately. Upon its arrival in Chicago it was erected with equal care and the supervising architect is authority for the statement that the slightest difference cannot be found in the construction of the building since its removal. It is a plain substantial one-story brick building with a gable roof and open belfry. Its dimensions are 25 ft long, 15 ft wide, and the walls are 14 ft high. There are two large square windows in each end, and semi-circular transoms over each of the wide doorways, both of which are on one side. Large doors of wood with heavy iron plate fronts once swung open for men who toiled for Uncle Sam in the building. In the war one set of the doors was taken away, but the other set remained, almost rusted from its hinges. The building is divided by a solid brick wall into two rooms. The smaller John Brown used as a prison during all his fighting in the larger one.

The Graphic for 9 January 1892 illustrated the remarkable structure designed by Architect George O. Garnsey, editor of the *National Builder*, to shelter the Fort (fig. 2).

According to the *Chicago Tribune* for 4 February 1894 the Fort was bought off its original site for $20,000 and the whole operation of moving it and setting it up at Chicago cost the promoters another $40,000. It did not catch the public fancy and after only eleven paid admissions were received, the project was abandoned and went into receivership. A year later the Fort was acknowledged a white elephant and threatened with becoming a stable (*Chicago*



2. Exhibition building enclosing John Brown's Fort, World's Columbian Exposition, Chicago (from *The Graphic* 1892).

Tribune 1 April 1895). Harpers Ferry wanted it back but it was discovered that the original site was no longer available (*Chicago Tribune* 5 August 1895); the Baltimore & Ohio Railroad had built a line of tracks over it.

The story of how the Fort did get back remains to be worked out, but return it did—first to a site on the Shenandoah River bottoms, and then to the campus of Storer College above the old town, where it remains to this day as a 'shrine' open to the public. The problem of how to get it back down to the original site near the Potomac belongs to the Park Service, which is now developing the Harpers Ferry National Monument.

NOTE We have so far been unable to consult a file of the *National Builder* edited by Architect Garnsey but understand it was published in Chicago beginning about 1885.

The Parrott Building, San Francisco, 1852

HAROLD KIRKER

Our writer, a Californian now teaching at the Massachusetts Institute of Technology, has prepared this profile from an extensive study of San Francisco's architecture about to be published on the West Coast.—Ed.

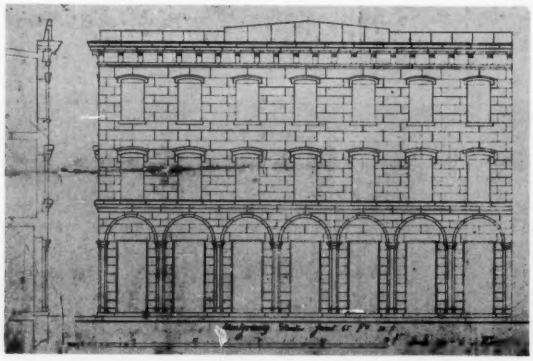
The building of Chinese granite designed in 1852 by Gold Rush architect Stephen Williams for John Parrott was the earliest major commercial construction in California and the first international building project in the West. Celebrated in Pacific banking circles as headquarters for Page, Bacon and Company and Wells Fargo, Parrott's Granite Block (fig. 1) was one of four historic stone structures to survive the Great Fire of 1906 and, until demolished in 1926, its somber Georgian façade on Montgomery Street was among the last reminders of San Francisco's Golden Fifties.

There is no better description of the building than that given by John Parrott in a letter to the Hon. T. Buller King, dated 2 May 1852 and preserved along with the architect's drawing (fig. 2) in the collections of the California Historical Society:

> The walls are to be 20 inches thick laid with Chinese Brick in cement, the two fronts on California and Montgomery Streets as per drawings herewith accompanying are to be Chinese granite smoothly polished and fitted in the best manner. The openings are all to be secured by four fold iron doors and shutters, made of boiler iron ¼ inch thick, set in frames and anchors worked in the walls, each to have from five to eight fastings.

Construction on Parrott's Block was begun apparently in midsummer, as a brief note in the *Alta California* of 8 August 1852 reported the work progressing rapidly under

1. Parrott's Granite Block, San Francisco (from *Architectural Record.*)



2. Elevation and section, Parrott's Granite Block (courtesy California Historical Society).

the direction of San Francisco contractor Bernard Peyton. It was completed in ninety days at a cost of $117,000.[1] The specifications laid down in Parrott's letter were generally followed, although the brick was certainly of American—rather than Chinese—manufacture and may have been burned locally. It cost the builder $140 per hundred and was laid by occidental bricklayers at wages of $20 a day. The foundations for the project were of stone quarried on Goat Island in San Francisco Bay.[2] Parrott was so pleased with the finished building that he presented the architect with a horse and buggy as a bonus—a gesture which Williams refused, regarding the gift as a breach of the ethical code of the nineteenth-century practitioner.[3]

The method of fabricating the stone work of the façade was remarkable.

> Mr. Parrott sent his agent, Mr. Bernard Peyton, to Hong Kong to negotiate for the material. There the stone was cut and dressed. Under Mr. Peyton's supervision each of the three stories of the new building was laid out and put together. Then each block of granite was numbered and a diagram drawn, showing the relation which these numbers should bear one to another. Finally it was all placed on a vessel and shipped to San Francisco.
>
> Inasmuch, however, as Chinamen had made the building, none but Chinamen could put it together, for all the blocks were marked in Chinese script; and this task of putting its parts together required an effort almost as extraordinary as the one which had been required to obtain the parts themselves. Derricks there were none, and in their absence the granite blocks had to be lifted by human hands and carried up ladders of bamboo to their pre-ordained niches. Twenty stalwart coolies, ranged along a stout bamboo pole, were required to carry each of the blocks to their places.[4]

It is said that because the coolies were illiterate and could not read the characters marked on the stones, a great Chinese architect was brought over to supervise their labors, and that he discovered the stones were cut and marked for the opposite side of the street, 'where no evil influences are to be encountered as will be found here'.[5] This was knowingly recalled by the Chinese colony when the famous banking house of Page, Bacon and Company failed in 1855.

Architect Stephen Williams was born in New York in 1816, came to San Francisco in the Gold Rush, and immediately entered into a successful practice which continued until his death in 1880. It is traditional in the Williams family that the architect was trained in England. At any rate he designed Parrott's Granite Block in the prevailing English style of commercial architecture with a slight pediment and heavy bracket hoods over the upper story windows. In the course of thirty years of California practice Williams had several collaborators, and for a period in the early sixties he was associated with the prominent pioneer architect Henry W. Cleaveland, disciple of Andrew Jackson Downing and author himself of *Village and Farm Cottages* (New York, 1856). Williams' son, Warren Heywood, who entered the family office in 1860, went to Oregon in 1873, where he made a reputation equal to that of his father. In addition to Parrott's Granite Block, Stephen Williams designed the Merchants' Exchange, First Calvary Church, Selby Shot Tower, and many San Francisco houses.[6]

NOTE The career of Warren H. Williams (1844–1888) is sketched by Lee H. Nelson, now of Yorktown, Virginia, in *The Call Number* XX, No. 2 (Spring, 1959), University of Oregon Library, pp. 4–15. —Ed.

1. John P. Young, *San Francisco: A History of the Pacific Coast Metropolis*, 2 vols. (San Francisco, 1912), I, 143.

2. Idwal Jones, *Ark of Empire: San Francisco's Montgomery Block* (Garden City, 1951), p. 57; Frank Soulé, John H. Gihon, and James Nisbet, *The Annals of San Francisco* (New York, 1854), pp. 414–415.

3. Undated letter from Williams' granddaughter to the author.

4. Agnes Foster Buchanan, 'Some Early Business Buildings of San Francisco', *Architectural Record* XX, No. 1 (July 1906), 23.

5. Alexander McLeod, *Pigtails and Gold Dust* (Caldwell, Idaho, 1947), p. 87.

6. *California Architect and Building News* I (June 1880), 63.

Two More Trautwine Buildings, 1830-1831, 1855-1856

FRANCIS JAMES DALLETT

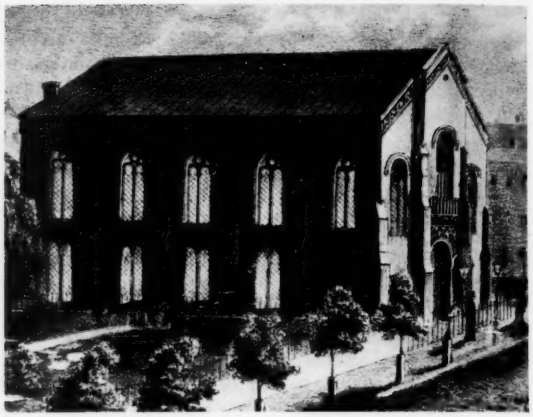
Librarian Dallett of The Athenaeum of Philadelphia prepared this contribution as a sequel to Agnes Addison Gilchrist's note on the 'Old Dorm', *JSAH*, Vol. XVII, No. 3 (Fall, 1958), pp. 32–33.—Ed.

Two Philadelphia buildings, long ago demolished, were, like the fortunately preserved 'Old Dorm' (1835–1838) of Gettysburg College, designed by John Cresson Trautwine (1813–1883).

The first was conceived when Trautwine was only seventeen and two years after the dated drawing to which Agnes Gilchrist refers. In November 1829 the Directors of the Bank of Penn Township (later the Penn National Bank and now the Central-Penn National Bank) purchased a lot at the northwest corner of Sixth and Vine streets upon which to erect a structure to replace their rented quarters. The iron work for the edifice was let on 15 December 1829 to David Stainrook, black- and whitesmith, and on 9 July 1830 the Building Committee reported to the Board a 'Plan of the Ground floor and Elevation of a Banking House, 40 by 50 feet', and stated that the expense of erecting the same would not exceed $13,500. On 10 August they reported that the architect had extended the depth of the building to fifty-six feet and on 18 August 1830 the cornerstone was laid.[1] In July 1831 the bank moved to its

1. Minutes of the Board of Directors, Bank of Penn Township, 12 May 1828 to 14 April 1837, *Minutes No. 1*, manuscript in possession of the Central-Penn National Bank, Philadelphia.

1. Bank of Penn Township. Photograph of 1884 (courtesy of Free Library of Philadelphia).



2. Lithograph of First Moravian Church, Philadelphia (courtesy of The Athenaeum of Philadelphia).

new home, 'a remarkably neat and chaste structure, stuccoed in imitation of marble', and a celebration for the workmen was given by Bank President Elijah Dallett.[2] A manuscript recently in possession of the Central-Penn National Bank listed the architect, J. C. Trautwine, and all the workmen. The only one whose name was copied, however, was Joseph S. Walter, brick mason, father of architect Thomas U. Walter.[3]

This Trautwine building was occupied by the Bank until 1884, when it was abandoned, the Penn National Bank then moving to a new bank, designed by Frank Furness, at the southwest corner of Seventh and Market streets, which was erected after pulling down the house in which Jefferson drafted the Declaration of Independence.[4] Fortunately, a D. J. Kennedy watercolor of the Sixth and Vine bank survives at the Historical Society of Pennsylvania,[5] and a photograph of 1884 is in the Free Library of Philadelphia (fig. 1). These show it to be a one-story structure of classical design, facing south on Vine Street. It had a projecting central bay in the front, flanked by pilasters and enclosing double entrance doors topped by an arched, recessed fanlight. The central bay of the entrance contains a low pediment over a continuous projecting cornice and there are two ordinary windows on either side of the central bay. The Sixth Street side has a large Palladian window centered between two ordinary windows. The west elevation corresponded to the east except that the Palladian window was narrower. The building at the rear (north) joined to a three-story brick house which the bank erected in 1831–1832 for its teller. The east and west walls of the small structure have the feeling of Strickland's Second Bank of the United States in miniature. The bank was protected by a cast-iron fence on the Vine and Sixth street sides. The building was pulled down soon after the bank moved away.

Joseph Jackson's biographies of Trautwine mention that he submitted a design for the Merchants' Exchange and name him as the architect of the First Moravian Church.[6] This was not the 1819–1820 structure for that congregation on Bread Street, for which Agnes Gilchrist says Trautwine did a drawing, but the subsequent church building of 1855–1856, at the southwest corner of Franklin and Wood streets. If a Trautwine drawing of the earlier structure exists, it must be a post-erection rendition, for Trautwine was but six years old in 1819.

In the spring of 1855, Trautwine presented a plan and architectural drawing for a new church edifice to the congregation of which he was a member. With John McClure engaged as builder, the cornerstone was laid on 30 April 1855; and the finished building, fifty-five by eighty feet, was consecrated on 26 January 1856.[7] It stood on the southwest corner of Wood and Franklin streets. A litho-

2. Edward D. Maher and John La Cerda, *This is Our Story: Central-Penn National Bank of Philadelphia Since 1828* (Philadelphia, 1953), p. 8.

3. Abstracts from the sheet which listed the workmen were taken in 1953 by Edward D. Maher. The original cannot now be located by the Bank and Professor Maher, of the University of New Brunswick, has destroyed the complete list.

4. The story of this historic demolition by the bank is told in detail in Thomas Donaldson, *The House in Which Thomas Jefferson Wrote the Declaration of Independence* (Philadelphia, 1898).

5. Reproduced in Maher and La Cerda, *This is Our Story*, p. 8.

6. Joseph Jackson, *Early Philadelphia Architects and Engineers* (Philadelphia, 1923), p. 185; Joseph Jackson, *Encyclopedia of Philadelphia* (Harrisburg, 1933), IV, 1142–1143.

7. Abraham Ritter, *History of the Moravian Church in Philadelphia* (Philadelphia, 1857), pp. 177–178. A lithograph of the building is opposite p. 176.

graph of the new First Moravian Church shows it to be a simple, two-storied rectangular building in the Gothic style, undoubtedly of brick construction stuccoed over, with a decorated frieze running continuously around the cornice (fig. 2). It had a plain gabled roof with a slight parapet on the front wall. The two flanking walls were each supported by six buttresses, and a pair of buttresses on the front wall contained the projecting door which was ornamented with Gothic tracery. The two flanking walls contained five large arched windows on each of the two floors. There were three similar windows on the front wall. The lower floor housed the Sunday School while the upper floor held the 'principal audience chamber', an area of eighty pews seating 500 people. A detailed description of the interior design and decoration has survived. Edwin Forrest Durang (1829–1911), another Philadelphia architect, was the designer of the organ case, which was built by the noted firm of J. C. B. Standbridge.[8] This Trautwine building, like the Bank of Penn Township, was abandoned when the congregation moved in 1892. Its date of demolition is not known.

As a further footnote, Trautwine exhibited in 1844 at the Artists' Fund Society in Philadelphia his design for a 'Monument' (this was undoubtedly the Washington Monument drawing of 1833 noted by Agnes Gilchrist), together with a design for a 'Fountain for Washington Square'. Like the former, the fountain was never erected.[9]

8. Ritter, *History of Moravian Church*, pp. 179–180. Durang's name is given incorrectly as Edmund.

9. Anna Wells Rutledge, *Cumulative Record of Exhibition Catalogues, The Pennsylvania Academy of the Fine Arts 1807–1870, The Society of Artists 1800–1814, The Artists' Fund Society 1835–1845*, (Philadelphia, 1955), p. 231.

BOOKS

Marcus Whiffen, *The Public Buildings of Williamsburg, Colonial Capital of Virginia* (Williamsburg, Va.: Colonial Williamsburg, Inc., 1958), 269 pp. $12.50.

The most extensive restoration of the twentieth century, comparable in magnitude and influence to those of Viollet-le-Duc in the last century, is Colonial Williamsburg. Because of its size and importance it is of unusual interest, and the sound decision has been made to publish its architectural history in a series to be called Williamsburg Architectural Studies. This is the first volume to reach the public.

The author, who is now at Vassar, was the architectural historian of Colonial Williamsburg. At one time he was an editor of *The Architectural Review* of London, and he is the author of several books on English architecture, among them *Stuart and Georgian Churches Outside London, 1603–1837*, published in 1947.

This background is particularly useful, since much of the architecture of Williamsburg was derived from that of England. He traces not only the influence of English building on Williamsburg, but also that of the latter on Virginia in the eighteenth century. On the other hand he is careful to show that some buildings had little influence beyond Williamsburg—the Governor's Palace, for example. The author never allows his enthusiasm to get the better of him, thus avoiding the pitfalls of some overzealous scholars who, at times, have marred the whole question of Virginia architecture. For example, a whole series of Virginia houses has been attributed to the designs of John Ariss, yet not one documented example of his work remains.

The author is equally prudent in discussing the problem of the 'Wren' building at the College of William and Mary. In spite of the authority of Hugh Jones, who attributed the building to no less an architect than Sir Christopher Wren, he finds little to justify the assumption in the case of the existing building. At any rate, it was only the first form of the building which Jones referred to, not the present one.

Although the author states that the influence of the arcaded piazza spread widely among the Virginia courthouses of the eighteenth century and even in the Caroline County Courthouse of 1803 at Bowling Green, it might also be pointed out that the tradition continued until well into the nineteenth century, examples being the Nelson County Courthouse of 1809 and Madison Courthouse, built as late as 1829. In both examples the precedent set by the Capitol, with a story above the arcade, is closely followed.

In an excellent chapter on the background of the period under consideration, the author points out the important fact that architects in the modern sense of the term did not exist in eighteenth-century Virginia. They were craftsmen, schooled in one or more of the building trades. Often they were master masons or master carpenters, capable of drawing an 'upright' or elevation, and a plan. Occasionally, they were gentlemen amateurs who possessed a few architectural handbooks along with some ability to design.

Basing his studies upon the records of Colonial Williamsburg, the author gives an account of the building of the Capitol, the Governor's Palace, Bruton Parish Church, the Powder Magazine, the Gaol, the Secretary's Office, and the buildings at the College. He goes on to trace their history after fires in the eighteenth century at the College and the Capitol. He continues with their history after the Capitol was moved to Richmond in 1780, and with their fate in the nineteenth century. There is also a brief account of the restoration begun in 1926. Because of its exceptional interest, it is to be hoped that a subsequent volume may be devoted to the restoration itself.

The eighteenth century had inherited from the Renaissance the belief that the arts should reproduce the harmonies of nature, or, as Sir Christopher Wren put it: 'natural' beauty was 'from Geometry'. The author shows clearly the mathematical basis of the designs of the College, Bruton Parish Church, the Courthouse of 1770, and the Palace and the Capitol. He points out that the principal dimensions of the plan of the Capitol and the Palace were commensurable: those of the Capitol had integers when divided by five and those of the

Governor's Palace when divided by six, while the College proportions were based on the Golden Section ratio.

Drawing upon the works of the late Fiske Kimball, the author has written an excellent study of Thomas Jefferson's architectural work at Williamsburg. At first glance it may seem strange that a whole chapter should be devoted to the ideas of a man who heartily disliked some of the buildings at Williamsburg, and regarded even the houses there as inferior to those at Annapolis. Yet he believed that the old Virginia capital would be greatly improved by enriching it with the ideas of romantic classicism. While none of his projected designs remain, his sketches and writings provide an invaluable source of material. He left drawings showing how he would improve the College by additions, and the Palace by a peristyle around the entire building topped by pediments. Had this been accomplished, it would have been the first temple form house of the neo-classical revival in America or in Europe.

The author writes that Jefferson's interest in architecture began with his early friendship with the connoisseur, Dr. John Morgan, in Philadelphia in 1766, if not earlier, at the Palace dinners of Governor Fauquier. In London the Governor had been a tenant of no less an architect than James Gibbs. However, it should be pointed out that there is additional evidence in a letter from his lifelong friend and secretary, William Short. In it he writes that Jefferson had told him often that his interest in architecture began when he bought his first architectural book from an old cabinetmaker in Williamsburg, while still a student there.

The illustrations of this volume point up the fact that architectural drawings are a rarity in seventeenth- and eighteenth-century Virginia. The few existing drawings of the period are admirably supplemented by the beautiful measured ones made by Singleton Moorehead. At the beginning of this century it was the practice to include superb measured drawings in books of architectural history. After the modern movement had eliminated much of the need for measured details, which had been used as the basis for traditional design, photographs and original sketches of the period took their place. It is good to see beautiful draftsmanship again contributing to architectural history. Among the drawings of restorations of particular interest are those for a chapel, which may have been designed for Williamsburg, and the drawing of the 'hospital . . . for persons of disordered minds' by A. L. Kocher and Howard Dearstyne.

Written in a lucid and readable style that will appeal to the layman as well as the expert, this is a distinguished contribution to the history of American art. It has been honored with the Society of Architectural Historians' Alice Davis Hitchcock book award, given annually for the outstanding work of architectural history.

FREDERICK DOVETON NICHOLS
University of Virginia

Rudolf Wittkower, *Art and Architecture in Italy, 1600 to 1750* (Baltimore: Penguin Books, 1958), 428 pp., 192 pls., 38 figs. $12.50.

Italian Baroque art, and especially architecture, has finally received its long overdue appreciation in a great work of scholarship in the English language. Each of the volumes of The Pelican History of Art has had to run the almost impossible gauntlet of thorough and original scholarship applied to a wide scope of the history of art for a general public. This has meant a compromise for the author, who must concentrate his material in some fashion. Professor Wittkower has made as effective a compromise in this respect as seems possible. His solution is to focus upon the greatest figures of Baroque art and within their *oeuvre* to analyze fully certain characteristic masterpieces. At the same time he presents in other chapters or sub-chapters all the other artists. Except for a few of these latter sections where the frequency of unusual names overwhelms the reader, the writing is superb, incisive, yet evocative.

The book consists of three parts in terms of the chronological periods: Early Baroque (*c.* 1600–*c.* 1625), High Baroque (*c.* 1625–*c.* 1675), and the Late Baroque and Rococo (*c.* 1675–*c.* 1750). Each part has an introduction dealing with the historical-religious situation of the period, particularly in terms of patronage. These introductory chapters characterize and explain magnificently the phases of Italian Baroque art. In contrast to the complexity, ambiguity, and fantasy of the preceding Mannerism, Professor Wittkower finds the Baroque style satisfying the requirements of the Counter Reformation in terms of 'clarity, realism, and emotional intensity'.

The book is an iceberg of knowledge, not in the sense of warmth, but in the tremendous knowledge hidden within it. This is apparent not only in the text but even more so in the notes, which are far more than bibliographical references. It is a shame that one of the most fertile centuries and a half of art on a consistently high level must be crowded into one volume, particularly when the English language has never before had such an offering. Single sentences or footnotes obviously sum up paragraphs of knowledge and scholarship, which now may never see print, but at the same time, if the publisher and editor of the series had not encouraged Professor Wittkower to undertake this work we might never have had this book, which will be the springboard for research in the Italian Baroque field for the next decade.

Despite the author's care in adjusting and handling the various aspects of his study I feel that the consideration of Italian Baroque architecture is the outstanding part of the book. One of the particularly fine contributions is the chapter devoted to Pietro da Cortona, who finally takes his proper place along with Bernini and Borromini to form the great triumvirate of the Italian Baroque. Not since Fabbrini in the nineteenth century has there been an analysis of the career of Pietro as both architect and decorator. His few works of architecture are all masterpieces, which, as Wittkower notes, grow from Mannerist subtlety and sensitivity but resolve Mannerist ambiguities into a personal Full Baroque.

The chapter on Piedmontese architecture is, likewise, one of the most revealing ones for an architectural historian, concentrating as it does on the work of Guarini, Juvarra, and Vittone. The first two are well known, but now Vittone is revealed as of equal stature. This chapter, however, breaks the basic organization of the book, as Wittkower points out, by including a fully seventeenth-century architect, Guarini, in the section on the Late Baroque and Rococo of the eighteenth century in order to isolate architecture of the Piedmont. The author reasons that a 'deep gulf' separates Guarini from Borromini and Cortona but admits that Guarini is even further from Juvarra of the eighteenth century. I do think that it would have been more illuminating, as well as more consistent, to handle Guarini as a High Baroque architect in juxtaposition to Borromini, Bernini, and Cortona. As a result Borromini would not seem to be quite as unique a seventeenth-century architect as the present organization of the book suggests. In fact, in his summaries of the two architects the author points to the feeling for Gothic structural principles in the works of the two men which relates them in contrast to the classic mode particularly of Bernini and to a lesser extent of Cortona.

Again the limitations of size have caused a great loss in that there is little consideration of the theater, urbanism, and landscape gardening, three of the most characteristic phenomena of the Baroque age. But for our loss we are repaid in the space gained with many new insights regarding familiar figures, such as the influence of German and Austrian architecture upon the work of Juvarra.

In addition to the great value inherent in the content of the book itself, there is a secondary value in that a summary of this nature presents a complete picture of past scholarship in the field and suggests areas for future work. For example, it is obvious that eighteenth-

century architecture in Italy has been neglected, although recently the foundation for such study has been laid with the appearance of monographs on many of the major architects. Again Professor Wittkower does not disappoint us, for in a few pages (pp. 240–244) he sketches the various architectural movements which must be considered in any later treatment of the whole era.

The Pelican History of Art has been oriented to a rather undefined audience. Most of the volumes are too scholarly and not readable enough for the general public, or at least the American public. This is true even for undergraduate readers in art courses. On the other hand the volumes have had to cover too broad an area to permit or encourage extensive original scholarship which would make a particular volume of more value than mere interest to a scholar in the field concerned. Professor Wittkower's book on the Italian Baroque, however, rises above these limitations both in its tremendous contribution to our knowledge and in its flowing prose.

DAVID R. COFFIN
Princeton University

Alan Gowans, *Looking at Architecture in Canada* (New York: Oxford University Press, 1959), 232 pp., 137 figs. $10.00.

Alan Gowans has performed a valuable service in presenting, for the first time, a historical study of Canadian architecture which encompasses both chronologically and geographically the breadth of this vast subject. Nor was this an easy task since even secondary sources were rare and large sections of the survey covered unbroken ground. Indeed, much of the early spadework was of the author's own doing, and his *Church Architecture in New France* (Toronto, 1955) remains the best of the regional studies yet published. Still the present volume is frankly not intended to be a profound history of a national architecture, but rather, as the title *Looking at Architecture in Canada* implies, a survey directed to the layman which simultaneously presents the historian with extremely useful illustrative and factual information.

The American reader must also remember that the text was written for Canadians, with the result that some of the terminology conveys a different meaning. An instance of this is the term Victorian Architecture, which includes all phases from the Greek Revival of the 1840s through the simplified classicism of the 1930s. This broad definition would not normally be understood in the United States.

The book has been divided into five sections beginning with 'The Pioneer Background' followed by a chapter on 'New France'. For the American reader accustomed to thinking in terms of the founding of Jamestown in 1607 or Plymouth in 1620 it is well to recall that the Port Royal Habitation at Lower Granville, Nova Scotia, was built in 1605, and marks the beginning of the French tradition in North America. The author next traces the development of ecclesiastical architecture until the period of English domination in the 1760s, with a particularly interesting discussion of Mediaeval and Baroque influences in New France. There follows a discussion of 'British North American' architecture during the first decades of the nineteenth century which, paralleling the Greek Revival in the United States, dwells largely on British and French classicism, and correctly stresses the importance of English pattern books.

Under the heading 'The Victorian Age' the author presents a sensitive appreciation of the Victorian social background against which he plays such interesting examples as the Parliament Buildings at Ottawa and University College at Toronto. The result is that this section, along with the earlier discussion of church architecture in Quebec, contains some of the most interesting reading in the book. Since the limits of the Victorian Age extend well into the twentieth century, the survey closes with a chapter entitled 'Since 1930'. Unfortunately at this point any real feeling of chronological development is lost and the reader tends to infer that modern architecture appeared in the 1930s as a combined result of new materials and a new sense of light and space. This illusion arises from a failure to relate properly Canadian architecture to its foreign sources.

In the earlier chapters, however, the author took care to correlate Canadian architecture to European developments, yet from the standpoint of presenting a parallel to United States architecture, and thereby establishing the *Canadian* as opposed to general American trends, the book falls short. Also the influence of the United States on her northern neighbor seems to this reviewer to be under emphasized.

While the author has prudently placed stress on the sociological and cultural factors which influenced the architectural expression, I believe a greater sustained interest and understanding on the part of the reader would have been maintained if there had been less philosophizing about general principles of architecture (which results in many, often questionable, generalizations) and more space had been devoted to the analysis of the architecture. In this respect one is handicapped by a complete lack of floor plans, while several of the illustrations were chosen for antiquarian interest rather than for historical importance.

In spite of certain reservations, the book nevertheless remains a very useful and significant addition to our knowledge in a field too long neglected by the historian.

H. ALLEN BROOKS, JR.
University of Toronto

François Bucher, *Notre-Dame de Bonmont und die ersten Zisterzienserabteien der Schweiz.* Berner Schriften zur Kunst, 7 (Bern: Benteli-Verlag, 1957), 280 pp., 73 illus.

Hanno Hahn, *Die frühe Kirkenbaukunst der Zisterzienser. Untersuchungen zur Bangeschichte von Kloster Eberbach im Rheingau und ihren europäischen Analogien im 12. Jahrhundert.* Frankfurter Forschungen zur Architekturgeschichte, 1 (Berlin: Verlag Gebr. Mann, 1957), 387 pp., 200 illus., 2 folding plans. 48 DM.

Lelia Fraccaro de Longhi, *L'architettura delle chiese cistercensi italiane, con particolare riferimento ad un gruppo omogeneo dell'Italia settentrionale.* Pubblicazioni della facoltà di filosofia e lettere dell'università di Pavia (Milan: Casa Editrice Ceschina, 1958), 342 pp., 114 pls., 75 figs.

The architecture of the Cistercians in the twelfth and early thirteenth centuries has been studied intensively in recent years. There have been the Aubert-Maillé volumes on France (1943), Dimier's collection of plans (1949), and Eydoux's review of the Spanish houses in *Cîteaux in de Nederlanden* (5, 1954, pp. 173–207), a new Cistercian periodical that devotes part of nearly every issue to current questions of the art and architecture of the Order. The older studies of Bilson, Enlart, Lambert, and so on, are still valuable, but so much new information has now been made available, through the detailed examination of many more monuments and through excavations, that our picture of early Cistercian architecture stands in need of some revision. The three volumes under consideration here undertake this revision for the three different regions mentioned in their titles.

The over-all similarities of twelfth-century Cistercian churches have long been recognized. There is a 'typical' Cistercian church

plan, comprising a square apse, a projecting transept with square chapels on the eastern side, and a nave with aisles. Aubert and others have pointed out the great variation from this scheme, which included such details as round apses and even chapel plans *en échelon*, the so-called 'Benedictine plan', and a variety of nave coverings, from wooden roofs to barrel and even groined vaults. It has more or less been accepted that the Cistercians both adhered to certain general principles and at the same time tended to make use of local traditions in the different regions where they became established. The origin of the Order in Burgundy is thought to have played a fundamental rôle in the development of both these tendencies: many Burgundian forms were incorporated into early Cistercian practice and carried abroad in the expansion across Europe.

As a result of the excavation of the abbey church of Himmerod (1138–1178), which was planned by Achardus, an architect sent out by Saint Bernard himself, Karl-Heinz Esser has advanced the theory that there was a 'Bernardine plan' especially favored by the daughters of Clairvaux. This was the rectilinear type just mentioned, and of which Fontenay is the outstanding example. Bonmont, in western Switzerland, is another, and François Bucher's volume gives powerful reinforcement to Esser's theory. Bonmont was founded by the Benedictines in 1123 and became Cistercian only in 1131. The church was begun soon after. One is tempted to agree with other reviewers, that Bucher's date of immediately after 1131 is too early—around 1140 seems better. The whole eastern end was certainly finished before the Order prohibited the erection of towers in 1153, and perhaps even before 1147, when three important Cistercians, the Bishop of Lausanne, Saint Bernard, and Pope Eugene III met in Switzerland, an ideal moment for the consecration of the completed portion of the edifice. The remainder of the monument was erected to about 1170, the western portal being added by a shop working in Genevan traditions. The church has a pointed barrel vault without ribs over the nave, and transverse barrels over the aisles.

Bonmont was the first foundation of Clairvaux outside Burgundy, and Bucher shows its importance in the expansionist policy of Saint Bernard. It is also perfect evidence for Esser's theory of a Bernardine design, and Bucher's analysis of this design and the whole problem of early Cistercian aesthetics is acute and brilliant. It concerns space, light, and sound, and perhaps most perceptive of all, the attribution to Saint Bernard of a desire for 'neutral' architecture, the suppression of anything that may have had an emotional effect on the twelfth-century beholder. This is a fundamental contribution to the question, and anyone who has seen an early Cistercian church will understand that it is by no means a negative concept. The volume concludes with the study of the other early Cistercian foundations in western Switzerland, of which Frienisberg, Hauterive, and the Maigrauge are the most important for us today. All were begun with similar but not identical plans and had barrel vaults, except Frienisberg, where the nave may not have been vaulted. The interested reader will wish to consult Vallery-Radot's review (*Gazette des Beaux-Arts*, s. 6, v. 51, 1958, p. 192) for a modification of the date proposed for Hauterive. The book is clear and concise and is accompanied by English and French summaries at the end. Such completeness makes the absence of an index all the more extraordinary.

Hanno Hahn's volume on early Cistercian churches in Germany carries Esser's theory to an extreme and somewhat untenable position. It is fundamentally an analysis of Eberbach, as the subtitle indicates, and by extension, of the early Cistercian churches in Germany. At Eberbach itself, there were two distinct programs. The first was begun about 1145, but only the lower portions of the apse and transept were constructed; the second, about 1170 to 1178, when two altars were dedicated, completed the chevet and transept on an entirely different design and saw the construction of the nave. The whole edifice was dedicated in 1186. Hahn very strangely puts off the detailed reconstitution of the program projected in the 1140s until the end of the volume, although the plan is on p. 81. It was presumably to have comprised a nave of eleven bays covered by a barrel vault, with similar vaults over the transept and apse, the latter considerably lower than the present groined vault. The difficult point about the kind of vault planned in Eberbach I lies in the presence of colonnettes engaged into the corners of the apse and transept, but only the eastern crossing piers, while the western pair also were to support arcades thickening the tops of the walls, as at Poblet (fig. 178). Barrel vaults and the graded massing of the chevet are apparently so important to the author that he devotes 145 pages of the volume to them in the effort to prove that *all* vaulted Cistercian churches up to shortly after 1150 were planned this way (pp. 127, 228). I will not quarrel with the latter, since the former, the barrel-vault hypothesis, seems untenable if only on the basis of Pontigny. No one will question the unusualness of the design used in the groin-vaulted transepts of Pontigny; there is no pilaster behind the semicircular wall respond and no wall rib in the vault lunette, both regular features of the groin-vaulted basilicas of the Yonne River Valley in the twelfth century. But the Pontigny solution is not unique, and the pilasterless wall respond does not *a priori* indicate a plan for barrel vaults; moreover there is absolutely no evidence of any change of plan here. And the decidedly different form of the supports in the nave points to a fundamental change in the method of covering this part of the church, namely with ribbed vaults. It is very unlikely that the Cistercians would have left the original apse of the church unvaulted until the nave was well under way, as Aubert would have it; it is much more logical to assume the first apse had a groined vault, like the transept, and that ribs were planned when the nave was founded. The standard, and to my mind still valid, arguments are those of Fontaine (1928).

This lengthy section also serves another purpose for Hahn. Having worked out modular systems for the design of Eberbach II (the reader will profit more from a glance at his fig. 4, p. 67, than from a summary description), the author endeavors to show that they were in almost as widespread use by the architects of early Cistercian buildings as barrel vaults were supposed to have been, and the majority of the plans in the volume are accompanied by modular marks. In addition to stupefying difficulties of verifying such a thesis by exact measurements (these are given for certain buildings such as Eberbach, Fontenay, and Noirlac, and the author is aware of the pitfalls of the problem), it is not absolutely demonstrable for Eberbach itself. But before proceeding, let me deplore the omission of good measured drawings of the edifice in question. Such drawings exist, as the author tells us, and this was obviously the volume in which to publish them. Instead, the text contains long lists of measurements in some seven tables, which should of course have been placed in note. The real difficulty lies in the peculiar disposition of the western bay of the nave of Eberbach II. Here the groined vault, which normally spans two arcades in the 'gebundene System', is cut in half to surmount a single main arcade (figs. 89, 90). It looks as if there should have been one more arcade in the nave. This possibility is carefully examined by the author with respect to the adjacent monastic buildings, which are not all on the same axes as the church, and he draws the conclusion that such an additional bay may indeed have been planned early in the first campaign and would have been normal for the replanning of the second campaign, since eleven bays cannot be grouped by twos for the present groined vaults. An excavation in front of the façade, while not conclusive, seems to show that an additional bay to the west was not actually begun. Here again, there are no plans of the excavations, but only an inadequate photograph and a description. Hahn concludes that the present termination was devised in order to retain the modular system, and that the half vault was merely the result of ultimately poor judgment, since in later edifices where the same problem occurred, a single, narrow groin was placed over the westernmost bay. The author includes a brief passage on modules and proportions, and their possible meaning, based upon the preliminary studies of von Simson, whose book,

The Gothic Cathedral, had not yet appeared when the text was written; an appendix at the end of the volume brings this question up to date. In view of the lengthy discussion it would involve, I beg to be excused from the task of evaluating Hahn's modular system here and merely note that one can now compare it with von Simson's, for Fontenay, and include Bonmont (Bucher simply makes the comment that the Golden Mean was used at Bonmont, as it was at St.-Denis!); the confrontation of Hahn's systems with the original, large-scale plans, for instance those used by Miss Fraccaro de Longhi, should be very revealing.

Hahn's expansion of the Esser theory to include certain aspects of nearly all early Cistercian buildings incites caution in its very statement and therefore seems unconvincing. His organization of materials is labored—I have been unable to find more than a summary statement of the origins of the 'gebundene System' of groined vaults, which, after all, constitutes a fundamental part of Eberbach II—and if a foreigner may be permitted the comment, his language is involved and often unclear, especially by comparison with Bucher's.

Lelia Fraccaro de Longhi's study of Cistercian churches in Italy is essentially a series of short monographs on the houses in Lombardy (Chiaravalle Milanese, Cerreto, Morimondo, and so on), the Lombard type where a certain uniformity of plan and parti prevail (such as Staffarda), and those of the remainder of Italy and the islands, where the more famous Cistercian houses of Fossanova, Casamari, and San Galgano are located. The treatment of each monastery is careful and concise, and Miss Fraccaro is to be congratulated for assembling between one set of covers so much information, observation, and evaluation, especially on many little-known and badly studied churches. Unfortunately she seems loath to draw any major conclusions as to style beyond the comments on pp. 295 ff. In a brief passage at the start, she finds Esser's theory 'very interesting' and proceeds to demonstrate why she disagrees with it, by citing the many variants in Cistercian plans. One must observe that the theory is, after all, based in part on statistics, and Miss Fraccaro's point of view is a revival of that of Aubert and Maillé. There are many typographical errors in the volume, and others for which the author must bear the responsibility, such as the equation of George Kubler (1912–) with Franz Kugler (1808–1858) in the bibliography.

ROBERT BRANNER
Columbia University

George Kubler, *Arquitectura de los siglos XVII y XVIII*. Ars Hispaniae XIV (Madrid: Editorial Plus-Ultra, 1957), 379 pp., 467 figs.

This is the first monograph on seventeenth- and eighteenth-century Spanish architecture published since the appearance of Otto Schubert's *Geschichte des Barock in Spanien* (1908). But the studies on individual monuments published during the past fifty years are so numerous that of the 285 works listed in Professor Kubler's bibliography about ninety per cent postdate Schubert's work. Like other volumes in the Ars Hispaniae series, this book is well illustrated, and footnotes correspond to pertinent studies listed in the bibliography by number.

Following an interesting account of the effects of changing economic conditions on the architecture of the period, two chapters are devoted to the transition from the austere style of Juan de Herrera to the decorative fantasies of the early eighteenth century. In the first, 'The Relaxation of the [Herreresque] Canon, 1600–1680', Kubler includes Juan Gómez de Mora, Fray Francisco Bautista, and G. B. Crescenzi—masters who represented 'The Victory of the Baroque' to Schubert. These architects are grouped with the followers of Herrera to form a period which evinces more admiration for the architectural inventions of Italian mannerists than in inclination toward the Baroque. For the next group, beginning with Alonso Cano and including Figueroa, the Churriguera, Ribera, and Hurtado, Kubler rejects the misleading terms *Borrominismo* and *Churriguerismo* and, following Llaguno, entitles the chapter, 'The Heretics, 1680–1750'. While implying a more complete denial of Herrera's canon, this designation falls short of a positive characterization of the period. Throughout the book, Kubler avoids general style descriptions like 'Mannerist' and 'Baroque', preferring to enumerate specific traits. His disciplined descriptions are welcome because loose references to general style concepts (usually Italian) predominated in earlier studies. While his caution results in a desirable precision, his reluctance to use the term 'Baroque' or 'Spanish Baroque' leaves somewhat undefined the distinction of this period from the earlier Herreresque and also its relation to pan-European styles. It is true that the marked contrast between the severely plain exterior and the richly ornamented interior of the chapel of San Isidro in San Andrés in Madrid (1657–1669) was described as the first clear statement of the Baroque (p. 72), but elsewhere, and at greater length, the innovations of architectural theorists in the 1660s and the changes that occurred in architectural design about 1680 are restricted to an emphasis on foliate decoration applied in greater profusion to the staid surfaces of the block-like structures. The implication that this architecture had not become 'Baroque' (in an Italian sense) is also conveyed by the emphasis placed on the surprisingly late appearances of features like the curved entablature (not used until 1660), the Solomonic column (about 1700), the *estípite* support (about 1720), and the opposition of concave and convex wall surfaces (introduced in 1703—and then by a German, Conrado Rudolf). However, the style formed about 1720, when foliate ornament gave way to the lively linear patterns of undulating mouldings, is described as 'The Spanish Rococo', indicating an affinity with contemporary French architecture. Thus, Kubler's careful descriptions of individual works, without recourse to stylistic clichés, reveal the peculiarities of Spanish architecture and prepare for a new periodization in which interest in Italian Mannerist models is extended to the end of the seventeenth century and Spanish styles comparable to the Italian Baroque and, then, the French Rococo are dated after 1700. In the third chapter, entitled 'The Bourbon Reorganization', the architects of the eighteenth-century academy are related to either the increasingly Classicistic tendencies of Ventura Rodriguez or the Romantic inclinations of Juan de Villanueva. The distinctive forms of contemporary regional schools, particularly in Andalusia, the Levant, and Galicia, are described in the last chapter.

New dates and authors are assigned to some structures (notably the important sacristy of the Carthusian monastery in Granada); less influential rôles in the development of the period are apportioned to G. B. Crescenzi, José Benito Churriguera, and José Jiménez Donoso; and disturbing lacunae are noted, particularly the need for studies on architects like Juan Bautista Pérez, Andalusian works from 1725 to 1750, and Cordoban architecture during the entire eighteenth century. Also discussed are the origin and development of peculiarly Spanish architectural types, such as the retable-portal, the combination of portico and tribune, and, in particular, the *camarín*, an enclosed and often richly decorated chapel constructed immediately behind the sanctuary to house a revered image or its wardrobe.

By carefully describing the individual forms and evaluating and relating the information made available during the past fifty years, Professor Kubler has provided a convenient and up-to-date manual for seventeenth- and eighteenth-century architecture in Spain.

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A. Goswami (ed.), *Glimpses of Mughal Architecture*, introduction by Sir Jadunath Sarkar and text by S. K. Saraswati (New York: Wittenborn, 1953), 56 pp., 91 dwgs., 45 pls., $23.60.

The title of this book is precisely descriptive. Intended for a popular rather than a scholarly audience, it offers glimpses of the major monuments of the magnificent Mughal architectural style, unencumbered by any tedious apparatus of documentation, technical explanation, or detailed stylistic analysis. It was presumably designed with the laudable intention of stimulating appreciation and a modest understanding of the history and nature of these splendid buildings, which form one of the richest elements in India's cultural heritage, and in this it will doubtless prove successful where Percy Brown's more detailed and scholarly work on *Indian Architecture, Islamic Period*, might fail. Appropriately enough for its purposes, the book lays stress less on the nature of the monuments qua architecture than on their significance as products of the Indo-Islamic cultural fusion, the fruitful interaction between the two apparently drastically opposed artistic traditions of Moslem Persia and Hindu India.

Lavishly presented with a dozen colored plates, several score of line drawings, and a series of photographs, all on fine glossy paper and supplemented by a text with clear typography and broad margins, the book makes a handsome appearance, although some of the photographs are rather less than mediocre and the drawings show a jarring variety of style. If Sir Jadunath Sarkar's introduction is no more than a somewhat superficial and random collection of notes on Islamic history and art, the body of the text by the competent art historian S. K. Saraswati presents an admirably clear and readable exposition of the development of this architectural style in its cultural-historic context. One regrets, however, the absence of references to specific illustrations or, failing this, a convenient list of illustrations to be referred to while studying the text. Still more seriously, the disproportionate emphasis given to ornamental motifs combined with the total lack of plans, elevations, or structural diagrams make it difficult to grasp the nature of this architecture as space-defining and space-enhancing form. Anyone who has traversed the harmonious sequence of sunlit courts and luminous pavilions in the palace-forts at Delhi or Agra, or who has stepped through the great gate of the Taj Mahal into that exquisite mathematical world of lawn and trees and pools culminating in and enhancing the floating bubble-like domes and soaring minarets, knows that the surface ornament so often admired and so insistently pointed out by guides is but an exquisite shimmer or froth on the wave of an architecture which draws its strength from purity and clarity of its harmonious contrasting forms. It is of course possible that this quality, so peculiarly Islamic and so particularly foreign to the Indian tradition of organic and proliferating mass, is more apparent and more appealing to western eyes than to the Indian audience for whom the book was written. Nevertheless, it seems unfortunate that this aspect of Mughal architecture is not even recognized, and that the opportunity to suggest these experiences in terms of large-scale diagrams and fresh new photographs was totally neglected.

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Books Received

(Mention of a book here does not preclude its subsequent review.)

Marion Elizabeth Blake, *Roman Construction in Italy from Tiberius Through the Flavians* (Washington: Carnegie Institution of Washington, 1959), xvii+195 pp., 6 figs., 31 pls. Paper, $8.25, cloth, $9.00. Carnegie Publication 616.

T. S. R. Boase, *English Art 1800–1870* (New York: Oxford University Press, 1959), 352 pp., 96 pls., 12 figs. $11.50. Oxford History of English Art.

Theodore Bowie (ed.), *The Sketchbook of Villard de Honnecourt* (Bloomington: Indiana University, 1959), 14 pp., 63 pls. $2.00. Distributed by George Wittenborn Inc., New York.

A valuable and inexpensive publication of the illustrated pages from the manuscript now in the Bibliothèque Nationale. The overly modest introduction states that 'This simple edition, neither critical nor scholarly, of Villard's drawings, is intended for the nonspecialist'.

Bernard Champigneulle, *Perret* (Paris: Arts et Metiers Graphiques, 1959), 160 pp., 119 figs. $6.50. Distributed by George Wittenborn Inc., New York.

E. A. Fisher, *An Introduction to Anglo Saxon Architecture and Sculpture* (London: Faber and Faber, 1959), 104 pp., 48 pls. 42 s.

R. W. Hamilton and Oleg Grabar, *Khirbat al Mafjar an Arabian Mansion in the Jordan Valley* (Oxford: Oxford University Press, 1959), 352 pp., 109 pls., 258 figs. $26.90.

Gilbert Herbert, *The Synthetic Vision of Walter Gropius* with a foreword by Walter Gropius (Johannesburg: Witwatersrand University Press, 1959), 48 pp., 22 figs.

Jurgen Joedicke, *A History of Modern Architecture* (New York: Frederick A. Praeger, 1959), 243 pp., 465 pls. $10.00.

Ian McCallum, *Architecture U. S. A.* (New York: Reinhold Publishing Corporation, 1959), 216 pp., illus. $13.50.

Helen Rosenau, *The Ideal City in its Architectural Evolution* (London: Routledge and Kegan Paul Ltd., 1959), 168 pp., 32 pls., 90 figs. 30 s.

Marion Dean Ross, *A Century of Architecture in Oregon 1859–1959*, 24 pp., illus.

Samuel Wilson, Jr., *A Guide to Architecture of New Orleans 1699–1959* (New York: Reinhold Publishing Corporation, 1959), 80 pp., 270 illus. $1.50.

Periodicals Received

Journal of the Royal Society of Arts, London.
No. 5033, Apr. 1959.
No. 5034, May 1959.
Includes notes on a symposium concerned with the preservation of Nash Terraces, London. J. E. M. MacGregor, Maxwell Fry, and Louis Osman make major statements outlining the problems.
No. 5035, June 1959.
No. 5036, July 1959.
Sir John Summerson has written a very important article for this issue: 'The Classical Country House in 18th-century England'. The ideas are original and convincing. One can only criticize adversely the quality of the illustrations.
No. 5037, Aug. 1959.
No. 5038, Sept. 1959.
Includes a short paper on 'The Work of the Historic Churches Preservation Trust'

Revista de Historia de America, Instituto Panamericano de Geografía e Historia, Mexico City.
No. 45, June 1958.
No. 46, Dec. 1958.

The Japan Architect, Tokyo.
Vol. 34, no. 2, Jan.–Feb. 1959.
The international edition, published in English, of *Shinkenchiku*.

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